DOCUMENT RESUME

ED 086 693 SP 007 633

TITLE	A Research Study of the Handicapped and Disadvantaged in Northern Worcester County Leading to a Pilot Program in Occupational Education and Career Development.
INSTITUTION	Barkley and Dexter Labs., Inc., Fitchburg, Mass.; Fitchburg State Coll., Mass.
SPONS AGENCY	Massachusetts State Dept. of Education, Boston. Div. of Occupational Education.
PUB DATE	Jan 72
NOTE	262p.
EDRS PRICE	MF-$0.65 HC-$9.87
DESCRIPTORS	*Career Education; Career Planning; *Disadvantaged Youth; Employment Patterns; *Handicapped Students; Job Market; *Occupational Guidance; *Vocational Education

ABSTRACT

This report describes a study of the present and future employment possibilities for the handicapped and disadvantaged in Northern Worcester County, Massachusetts. The report is divided into three sections: a) Career Education, b) Research Study, and c) Sampling. The first section introduces the principles of career education and their applicability to the handicapped and disadvantaged. A proposal is set down for the establishment of a Career Education Center at Fitchburg State College which would bridge the gap between schools and the job market. The second section presents the development of a method for determining future job opportunities for the handicapped and disadvantaged youth. This method includes three steps: a) sampling of specific information on future employment plans through interviews and discussions with employers, b) examining economic information which would affect the job market, and c) relating the national and state data to the local model. The last section presents a sampling of existing occupational education programs relating to career development in Northern Worcester County. The appendixes include charts of occupational clusters, a glossary of terms, questionnaires, and industrial classifications and occupational titles. (BRB)

B

ED 086693

SP 007 683

A Research Study of the Handicapped and Disadvantaged
in
Northern Worcester County
Leading to a Pilot Program
in
Occupational Education and Career Development

Conducted Under

PROJECT NO. 1 CONTRACT NO. 1

Commonwealth of Massachusetts

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

In Cooperation with
The State College at Fitchburg

January 1972

BARKLEY & DEXTER LABORATORIES, INC.
50 Frankfort Street Fitchburg, Massachusetts

FILMED FROM BEST AVAILABLE COPY

PREFACE

A RESEARCH STUDY OF THE HANDICAPPED & DISADVANTAGED AND OCCUPATIONAL EDUCATION

THE RESULTS OF THIS STUDY ARE PRESENTED IN THIS REPORT IN THREE SECTIONS:

SECTION I - CAREER EDUCATION

An introduction to the principles of career education and their applicability to the handicapped and disadvantaged with conclusions and proposed future action.

July, 1972

SECTION II - RESEARCH STUDY

An in-depth development of a method for determining future job opportunities and an example of reduction to practice by using North Worcester County as a model.

June, 1971 - January, 1972

SECTION III - SAMPLING

A sampling of existing occupational education relating to career development in North Worcester County.

January, 1972 - May, 1972

This report has been prepared for Fitchburg State College and the Division of Occupational Education, Massachusetts Department of Education under a contract between Barkley & Dexter Laboratories, Inc., and Fitchburg State College. The funds to support this contract were provided to the College by the Federal Government under Public Law 90-576 through the Massachusetts Department of Education.

The project was initiated on the realization that there did not exist in one place, significant accurate data concerning the present and future employment possibilities for the disadvantaged and handicapped in Northern Worcester County, nor was there a process available through which such data could be readily collated and analyzed. Barkley & Dexter Laboratories, Inc., were commissioned to devise a process for developing an adequate data base, to report on the employment picture and projection for the stated geographic area and to propose in pilot form, ways of providing more effectively for the preparation of the disadvantaged and handicapped for gainful employment.

In submitting this report, the College wishes to take note of the support and encouragement given to this project by the Associate Commissioner of Education, Dr. Charles Buzzell and his staff, particularly Mr. William Thomas and Mr. Sumner Rotman and Mrs. Martha Duckett from the Division of Occupational Education. These people have actively supported the College's attempt to develop a worthwhile research project having great long-range impact upon the opportunities for the handicapped and disadvantaged from Northern Worcester County.

These objectives have been fully realized in the report which follows.

FITCHBURG STATE COLLEGE

SECTION I

CAREER EDUCATION

President James J. Hammond
Fitchburg State College
Fitchburg, Massachusetts

TABLE OF CONTENTS

SECTION I

Page

PRINCIPLES OF CAREER EDUCATION FOR THE HANDICAPPED AND THE DISADVANTAGED.... 1 - 2

CAREER EDUCATION IN AMERICA.......................... 3 - 10

CURRENT MODEL OF CAREER EDUCATION..................... 10 - 15

DISADVANTAGED AND HANDICAPPED YOUTH................... 15 - 16

THE PHYSICALLY OR MENTALLY HANDICAPPED............... 16 - 17

EQUAL EDUCATIONAL OPPORTUNITIES FOR HANDICAPPED CHILDREN........ 17

APPROPRIATE PROGRAMS FOR THE HANDICAPPED............. 17 - 19

CAREER EDUCATION FOR DISADVANTAGED YOUTH............. 19 - 25

CAREER EDUCATION IN THE SCHOOLS...................... 25 - 29

CAREER EDUCATION IN NORTH WORCESTER COUNTY........... 29 - 37

NEED FOR THE ESTABLISHMENT OF A CENTER............... 37 - 39

RENEWAL CENTER FOR CAREER EDUCATION.................. 40 - 41

SCOPE OF CAREER EDUCATION CENTER .... 42 - 44

PARTNERSHIPS... 44 - 45

CENTER FOR RESEARCH AND RENEWAL...................... 46

FINAL REPORT JULY 1972

PRINCIPLES OF CAREER EDUCATION FOR THE HANDICAPPED AND THE DISADVANTAGED

Career education is woven throughout the fabric of human history. It is a dominant condition of every stage of the evolution of societies and cultures.

The vitality of a primitive culture was manifest by the manner in which people developed new ways of providing for their material needs and trained their youth in such processes. Career education has been a fundamental requirement in tribes, in races and in religion as well as a recognized need of every advanced nation. It is a complex of such factors as tradition, geography, resources, finances, as well as human qualities.

Career education - a current emphasis of an age-old goal in education - is a program embracing many subjects and departments. In fact, all standard school subjects have implications for and make contributions to career education. How can education be meaningful unless it provides children and youth with a comprehension of the world of work along with other essential needs of man? It is impossible to distinguish or determine the particular content and the experiences of childhood which will influence the choice of a career or be useful ultimately in one's performance of the duties in a career. Yet formal education must take cognizance of the realities of life, and open the door to career opportunities, either directly to positions that provide satisfying work or to additional schooling leading to the professions. Just as success and satisfaction in any job are determined by the total personality of the job performer so it is that all school experiences from kindergarten through high school contribute to career education. More precisely, all experiences a child has, in and out of school, have a bearing on his choice of a career and his probable success and happiness in it.

In the words of the recent U. S. Commissioner of Education, Sidney P. Marland, Jr., addressing the International Association of Education in Canada in 1971: ... "Career education is not merely a substitute for 'vocational education' or 'general education' or 'college preparatory education'. Rather, it is a blending of all three into an entirely new curriculum..." Career education, as he views it, should be "designed for the attache case professions as well as lunch box occupations." Hopefully, it will add strength to the need to eliminate the artificial separation between things academic and things vocational. Three factors will distinguish career education from traditional vocational education: "It will be offered as part of the curriculum of all students; it will permeate the entire spectrum of a youngster's education, from kindergarten through high school; and it will offer a much wider range of occupational choices than are now available in regular vocational education programs..." Certainly, it should reveal a great range of occupational options to students.

CAREER EDUCATION IN AMERICA

In America, career education is rooted in a free enterprise system where individual initiative, imagination, industriousness, ingenuity and daring are prime qualities for success. It is predicated on inalienable rights of man not only to exchange his labor and talents for pay but also to give due consideration to his health and safety, his well-being and even his opportunity for self-fulfillment. To encourage workers or future workers to even hope that they will be able to find employment that is self-rewarding and self-fulfilling reflects an idealism that is achievable only when all parties of the economic system recognize the dignity of each individual and the social character of business, labor and industry as well as the legitimacy of appropriate return for labor, for investment, ingenuity, and other personal inputs by which success is attained. There must be close correspondence between the ideals and the philosophy of career education and the prevailing values of the economic system. There must be opportunities for all to develop their capabilities and there must be a market for the expression of these capabilities in gainful employment.

Even if the millenium in social justice should be reached, it will still be necessary for applicants to demonstrate why they should be given job preferment over others who also make claim to having appropriate abilities and other qualifications. There will be competition for jobs, for some will prove to be considered more qualified than others. In general, or in theory at least, the rewards will go to those who have the most to offer in a given situation. It will not always be the swiftest, the strongest or the brightest who receive the prize but those with greatest assets will be most apt to have more opportunities. Effort, persistence, initiative and ingenuity, like the ability to get along with other people, are prime personal qualities. In a given situation, the personality or character of an applicant could well be the determining factor in obtaining employment. A pleasing personality, an even disposition, a certain conscientiousness and a genuine dependability are traits that employers react to positively. Such qualities are more important in many occupations than are specific skills. They are in fact, skills in themselves. They are the qualities that have enabled many workers to secure and to retain employment. They contribute immeasureably to the success of many small businessmen.

Every youth must be provided sufficient opportunities to enable him to gain a realistic insight into his own capabilities. This implies that somewhere within his total environment he may undergo a wide variety of experiences, viz., artistic, technical, mechanical, social, political and economic as well as academic.*

---

*Super and Crites, as a result of their research on interest factors and propose the following categories:

1. Scientific - an interest in knowing the why and how of things.
2. Social welfare - an interest in people for their own sake.
3. Literary - an interest in the use of words and the manipulation of verbal concepts.
4. Material - an interest in working with tangibles.
5. Systematic - an interest in keeping records, computing, handling electrical details.
6. Contact - an interest in meeting or dealing with people for material gain.
7. Aesthetic expression - interest in creating works of art.
8. Aesthetic appreciation - interest in seeing or hearing works of art.

These experiences may be formal or informal, organized or happenstance but each provides a youth with personal awareness of those activities he likes or dislikes because he can or cannot experience success and satisfaction from them. Whatever he tries and whatever impressions he gains from that experience influences the kind and extent of later selections. The programming of such experiences should not be controlled by a rigid schedule. The scope should be extensive but the sequence may well be random. It may be much more important for a student to engage wholeheartedly in those experiences which hold his interest than it is to require him to undergo certain activities by the teacher.

The youth must entertain imaginative as well as realistic expectancies. Over a period of years he will grow to know and to accept his limitations as well as his desires and ambitions. He must acquire confidence in his ability to achieve satisfactorily in some field. He must have a basis for believing in himself. A child of poverty has a far narrower perception of occupations than has an affluent child. Thus, a disadvantaged youth has fewer occupational choices. His aspirations are most limited, not only because of impressions acquired through family socialization, but also because he personally has negligible exposure to higher job levels.

The environment in which a youngster grows up has considerable influence on his development. Adverse social conditions and a deprived background combine to set limits on both educational and occupational aspirations. It is evident that environment plays a part in causing certain youth to exhibit personal characteristics associated with the academically disadvantaged. Obviously, the level of aspiration is of crucial importance in the career development of a disadvantaged youth. His perception of his own future influences his attitudes, his beliefs, his faith and trust in any linkage between ability, effort, reward and advancement.

The influence of the family upon career choice is greater than has generally been recognized and should be given greater consideration. There is no doubt that the family is the primary socializing agent of the child. Each family creates its own sub-culture of norms and values. A bright child with innate capabilities can be stunted and fail to achieve his potential under the influence of a negative sub-culture. On the other hand, a child of lesser abilities living in a bountiful and nourishing setting has a boundary beyond which he cannot rise. The point is that each individual is a particular product of (1) genetic endowments, (2) environment, and (3) unique experience. Throughout childhood and subsequent phases of development, the family is a continuing source of emotional and financial support. Thus, the family has significant impact on career choice. It is through the overall influence of the home that a young person develops perspective of what is expected of him, what he should be doing and what his particular role in society entails. The youth is also limited in terms of the practical resources his family can contribute toward the achievement of objective goals. Therefore, as much as possible should be determined about the home if youth are to be adequately assisted in planning their career education. It is in the home that first remedies are to be applied if the affects of the school are to be meaningful. Research studies indicate that permanent individual change in self-concept and role performance is almost impossible unless accompanied by basic modifications in the family's posture, motivation, perception and resources.

Patterns of growth and development of the child of the poverty-stricken environment must not be neglected. It has been established that certain, possibly critical, emotional, linguistic and cognitive patterns associated with social background are already present by the age of three.

Since the home is the major center of training in attitudes, habits and values, it would be advantageous if the school authorities could determine ways of working with the home. It must not be assumed that the school function is merely to compensate for the deficiencies of home training. The home is a key component of the career education system and the principal teacher is the mother, the child's day-to-day caretaker. She is of enormous influence. What parents expect, what peers advocate, what teachers demand or inspire, all contribute significantly in shaping the outlook young people form and the approach they take.

Part of the process of acquiring a sense of worth, of possessing a feeling of self-sufficiency, of knowing something of one's capabilities takes place in the kind of growing up that requires the individual to assume responsibility for providing for some of his own needs and being accountable for performing chores and tasks. Work experiences that require the worker to use his head as well as his muscles and heart; work that serves a good useful purpose; work that challenges the strength, the stamina, the ingenuity, the imagination; work that satisfies the spirit and is the stuff of one's dreams; work that requires accountability; all are a part of the kind of growing up that prepares a young man or young woman each step of the way to draw upon his or her own resources in charting and achieving self fulfillment in career goals.

Success in a job, an occupation, and, most certainly in a career depends on more than proficiency in some set of manipulative skills. It requires more than a training even of mind and body. It involves the total person, e.g., all that one is in his personality, character, temperament, as well as in his ability and ambition. Obviously, all school experiences, planned or unplanned, have some effect on such total development. The home, the neighborhood, the school and all the human beings associated with the growing child and his world are all determinants of the direction and the character of his career education. For it is the cumulative effect of all these, and the integration of these within the individual which constitute his attitudes, his aspirations, his self-concept, his spirit, his style, his quality of resourcefulness; in short, what it is that he has to draw upon.

Schooling for the disadvantaged must first include a strong measure of activities which may not appear to be cognitive but which do, in fact, increase the measured intelligence. Children respond to programs that reflect their interests and abilities. Psychological studies also demonstrate that technical skills and technological insight require as high a degree of imagination, ingenuity and creativity as do those subjects based upon verbal facility. Second, much of our education in technical and technological skills and insights is derived from realities. To down-grade the importance of technology is to forego the possibility of analyzing and understanding American society. Third, it ignores the fact that the humanistic superstructure of our society - its arts, literature, music, philosophy and all the other so-called "higher things of life" - have been made possible by man's technological progress throughout the centuries. In other words, the contributions of technology to human society and culture must not be glossed over, nor obliterated completely.

The therapeutic potential of occupational education should not be overlooked. There is conclusive evidence that over the years many vocational programs have made a tremendous psychological difference to thousands of youth. It can be of unique value with disadvantaged students. As a consequence of bona-fide success experiences, they can acquire attitudes of personal worth and dignity. While the cognitive qualities of knowledge and skill are not neglected, the primary emphasis is placed on the development of attitudes and feelings - the affective qualities.

CURRENT MODEL OF CAREER EDUCATION

The current model of career education, extending from kindergarten through college with provisions for continuing education, including retraining, is as complex as it is comprehensive. No longer can it be contained in a specialized school isolated from the rest of the school system. No longer can it be defined as preparation for a specific job. Yet, though it is incorporated at each level of the school program and is dependent upon the subject matter and values of all subjects, it possesses a particular character and identity of its own. It would be a serious mistake to misinterpret its unique character and to give the impression that career education is simply an added dimension of established programs. While it may well be a matter of increased emphasis, an enrichment, it must be more than that.

Like such other worthy ends as education for citizenship, character, worthy use of leisure, and consumer literacy, career education must be considered as a prime, integral part of the overall educational system. Not only must it be given due attention every step of the way but the purposes and activities must be appropriate and the resources and facilities adequate and relevant for each grade level. It is not enough to acknowledge it as a bona fide inclusion in the program (K-14)* and to provide adequate and appropriate emphasis. It must also be recognized that it requires particular types of activities and opportunities for direct, realistic, functional experiences. It places stress on action, improvising, providing and producing. It entails experiences away from school, trips to area and local establishments as well as bringing the world of work into the school via video tapes, slides, photographs and other media. As well, work-study experiences should be incorporated into school programs, with students receiving wages for their employment.

A serious detriment to the growth and progress of career education is the persisting dichotomy between traditional academic subjects and those readily identified as useful, practical or artistic. Those in the elite group are considered to be major subjects, the others are called "special" subjects. It is as though educators were afflicted with a form of educational schizophrenia, a symptom of which is to create specious dualisms valuing one subject over another. Formal education is understood to be and, in general, is accepted as a process by which teachers conduct prescribed lessons through assigned readings. These verbalistic exercises may be spiced with audio-visual aids and may, on occasion, feature special projects of one kind or another.

---

*Kindergarten through Junior College

They may entail spirited classroom discussions as well as the preparation of papers by students. But, by and large, they represent the process of acquiring information via words and the expression of such acquired information through words.

Today, the status subjects are those which students read about, write about and talk about. In other words, schools are still word-bound. Although the claim is not made as openly today, the ghost will not lie down, and the belief persists that the book-centered subjects are the ones that train the mind and have the most far reaching applications and implications. There is near total dependence upon textbooks and talks by the teacher. Learning becomes identified solely with one's familiarity with words and numbers and facility in manipulating them. There is a need for a more balanced approach. Overlooked are other symbols which man uses in expressing his thoughts. So also is the productivity of learning through interaction with situations, objects and other people and from experimentation. Words, to be understood, to be true referents, require experience with objects, action, people, conditions and circumstances. For example, words such as hard, soft, smart, dull, hot and cold require for comprehension the use of the tactile sense. Sweet, sour and bitter are determined by the sense of taste. Frequently words are known only in a limited sense. Both fullness of meaning and nuances of meaning are obtained through the feedback of new applications or new experiences. Some people excel in verbalizing their experiences. Others do their thinking and express their thoughts and feelings through spatial and manipulative experiences. They can conceive shapes, form, condition, operation or application and reorder and develop them. They can conceptualize new arrangements, relationships and sequences. They can visualize cause and effects. It is strange that people cannot recognize the fact that there are different styles of learning and that one is not necessarily better than another. The person who learns one way may be different in that respect from members of his family or class but that does not imply that he is a brighter or duller student. The fact that many thousands of students drop out of school because their style of learning is not acknowledged should force educators and parents to provide a greater variety of experiences and more options. In every style, students will acquire information, will process it, organize, evaluate and apply it. All styles require conceptualizing as well as performing. Bright pupils will usually do well in any style. Slow students will have difficulty with any one of them. All students should have the opportunity to learn by as many ways as they can. Teachers should be trained to understand more fully the conditions under which students learn. The emphasis should be shifted from technique of teaching to conditions and circumstances of learning.

Sufficient flexibility must be provided in the curriculum to permit all students to have experiences that not only enhance their learning but also further their vocational development.

Dr. Marland has stated the conviction that properly effective career education requires a new educational unity. He advocates the breaking down of the barriers that have divided our educational system into parochial enclaves. He claims the answer is to be found in blending "our curricula and our students into a single strong, secondary system ...... let us end the divisive, snobbish, destructive distinctions in learning that do no service to the cause of knowledge and do no honor to the name of the American enterprise."

In its introductory phase, career education is broad, general, impressionistic, establishing awareness, understanding and appreciation of prevailing economic practice as exemplified by American business and industry. Children can comprehend that the meeting of personal and social needs is done most effectively through planned, organized action. They can grasp this concept through existing examples that can be shown to them. It soon becomes obvious that in order to operate a business or industry, capital has to be accumulated and made available. Whether the source is private or governmental, the capital must be managed and multiplied.

Career expectations and outlooks must be realistic but not restricted because of lack of ambition, confidence or idealism. Those who are handicapped or who through no fault of their own, suffer some disadvantage, must be provided special opportunities in order to prepare themselves to compete effectively. They must be able to make the most of the abilities they possess and to compensate for their handicaps. Whatever extra assists they are given will be of little avail unless they extend themselves to make the most of their opportunities and prepare themselves for the realities of competitive conditions.

DISADVANTAGED AND HANDICAPPED YOUTH

Disadvantaged and handicapped youth need and must receive assistance in overcoming their diminished self-confidence and sense of worth. They need a wide spectrum of background experiences. They need persistent encouragement. They need compensatory counseling. They must be aided in identifying opportunities and urged or even prodded to take advantage of them. They must evaluate self-inflicted handicaps and limitations for what they are. They must see the worthlessness of self-pity. It is of the utmost importance that fair play, ample and due reward and other forms of deserved recognition be the rule, rather than the exception, in their experiences. School experiences must exemplify the value system advocated and certainly not confirm unwarranted suspicion and distrust.

While individualized instruction for every child may constitute an ideal, it is an absolute must in the education of the disadvantaged and the handicapped. Career education must be predicated on the uniqueness of an individual in his relation to an existing, though dynamic economic system. There has not been enough stress placed on the differences of people.

Realism is another point that needs stressing. Functional, practical, needed jobs have more purpose and interest for the disadvantaged. For older youth, on-the-job, work-for-pay educative experiences are preferable. The need for money is imperative. Each of these learners must learn what his style of learning is. He must cultivate that style, determine his best pace and proceed to develop his capabilities as a student. Each must develop the skills of gathering data, making judgments from this data base, and basing alternative courses of action upon the best data available. The more independent each can become in his ability to acquire information, to organize his thinking, to evaluate the evidence and to make judgements based on the weight of evidence, the more each individual will find opportunities opening up to him.

THE PHYSICALLY OR MENTALLY HANDICAPPED

In recent years, it has become apparent that, with the appropriate kind and amount of assistance, many of those who have a physical or mental handicap that hampers them in their quest for a so-called normal life, can develop their minds and bodies to a degree that enables them to live full and productive lives. It has been estimated that each handicapped child who receives an appropriate education and is able to secure employment, saves society a half-million dollars: half in reduced welfare and institutional costs and half in increased productivity. In economic terms alone, it is short-sighted not to provide a proper education whereby, according to the experts, 90% of the handicapped can become fully functioning, taxpaying citizens, rather than an economic drain on the nation.

EQUAL EDUCATIONAL OPPORTUNITIES FOR HANDICAPPED CHILDREN

In addition, equal educational opportunity for handicapped children is no less justifiable than equal educational opportunity for any other child. With the right type of education, many of these youngsters can so develop their minds and bodies that they will be able to live full and productive lives. There is little excuse for excluding from the schools of the United States the half-million to one million handicapped children who currently are not being provided for.

APPROPRIATE PROGRAMS FOR THE HANDICAPPED

Comprehensive programs which cope with even one type of handicap are rarely found from the primary grades through high school. Appropriate programming for the varied types of handicapped children, or recommendations which provide pre-school education as well as meaningful occupational preparation for older adolescents are practically non-existent.

The State educational agencies themselves estimated in 1970 that over 3.4 million of the six million handicapped children in the United States did not receive any suitable educational services designed to meet their special needs. Thus 57% of the handicapped children in the nation, the Education Commission of the States reports, must receive special help or they are likely to become despairing and dependent upon society to support them.

Edward Martin, Associate Commissioner of the U. S. Office of Education has recently stated in Compact, the publication of the Education Commission of the States: "... Over the next four years, 2.5 million handicapped children will be school-leavers either by graduation or the drop-out route. Of that number, less than 1 in 4 will be fully employed or going to college. Another 40 percent, that is, one million handicapped young people, will be under-employed. Another 25 percent of this population will probably require welfare assistance. It is our belief that with the appropriate career education, coupled with appropriate placement programs, virtually all of these young people can be more meaningfully employed and make productive contributions to society."

Commissioner Martin points out one of the blind spots the public has about the educability of the handicapped, when he notes: "I think, perhaps, that many members of the general public see handicapped children only in terms of stereotypes - the most severely retarded child, the most manifestly emotionally disturbed child, the most critically physically handicapped child - and while those of us in special education realize that what they are picturing represents only the extreme 5 or 10 percent of the handicapped children, these assumptions make it seem as though special education is a nice thing to do, a type of kindly busy-work.

In sharp contrast are the real results he records of educational programs which have a career orientation in these words: "The success of educational programming for the blind and for the deaf is now well known. It is possible to point, for example, to the excellent programs of a state school for the deaf in New Jersey which is providing career educational opportunities to every youngster and which has been successful in placing every graduate over the last ten years in a job."

Surely, the success of pilots such as this program for the handicapped with a career education orientation should be incorporated into any educational program attempting to meet the needs of the handicapped.

CAREER EDUCATION FOR DISADVANTAGED YOUTH

Career education is especially beneficial to disadvantaged youth. They have a particular need for functional education. They learn through experiences. They have to be motivated by a need. It is not their style to resort to words and symbols when faced with immediate problems to be solved. Instead, they are prone to respond with action or activity. Career education provides this real, practical approach to life and the pressing problems attendant upon making a decent living.

Children of the lower economic class seem much less able to analyze things from a perspective other than one of a personal or local character. They are highly concrete and immediate in their approaches to situations and objects. They tend to have better categorizing ability, except for the distortions resulting from poignant personal experiences. Under appropriate conditions, they can operate analytically quite well though they do not habitually or ordinarily do so.

In order for a program of career education for the disadvantaged to have any hope of true success, it must take cognizance of the fact that persistent poverty over generations creates a culture of survival. Goals are short-range, restricted. The outsider and the external world are suspect. One stays within his world and gets what he can. Beating the system takes the place of using the system.

Such a culture of poverty gets to the young early, influencing the way they learn to set goals, mobilize means, delay or fail to delay gratification. Very early, too, they learn ingroup talk and thinking. Their use of language tends toward a parochialism that makes it increasingly difficult to move or work outside the poverty neighborhood and the group. Often, they partake in a rich culture, intensely personalized and full of immediate rather than remote concerns.

The motivation and the expanded opportunities implicit in career education are means by which disadvantaged people may break the cycle of poverty. It may enable them to expand their horizons and to heighten their expectations. Career education makes it possible for the poor to gain a sense of their own power through jobs and through increased community involvement.

In many cases of disadvantaged children, the lack of paternal influence must be compensated for by a strong school program oriented toward the world of work. Instead of the frustration of defeatism and bitterness, a hope of opportunity and success can be inculcated through career education.

To be truly effective, this orientation must be incorporated into the educational programs in the schools. The needs of the disadvantaged lie beyond merely compensatory education. There must be an uplifting of their ambitions, idealisms and talents. They must develop confidence, faith and trust that they can compete and be successful in regular programs with their peers. The comprehensive programs in career education being proposed for all children, with some adaptations, are appropriate for the disadvantaged, as well as for all other pupils. Emphasis must be placed however, on encouragement, motivation, and counseling and on widening the horizons of disadvantaged youngsters, helping them become aware of the opportunities really available to them, if they have the will.

The importance of having money is of paramount importance to those in need. There must be available viable alternatives for gainful employment for older youth even while in school.

Options must be open to the young especially, offering pay for work which enhances the dignity and personal worth of the individual. Such options are possible through work experience programs described elsewhere in this report.

One area that must receive special consideration, if career education for the handicapped and the disadvantaged is to be effective, is that of career counseling. The concept of "matching youth with jobs" is a complicated matter which encompasses more than the manipulating of statistical data. It must also encompass factors such as interest, temperament, capability and the response of the given individual to the fact of being handicapped or disadvantaged, for one need not accept the fact of permanence in being handicapped or disadvantaged. One may have a handicap and not be handicapped. The thrust of these programs is to enable people in these categories to surmount their handicaps, to rise above them, to succeed in spite of them and to parlay what might be deficiencies into advantages instead of preparing themselves for placement in one of the well-established low-level slots. New slots have to be made that do not impose too low a ceiling. There must be opportunity for advancement.

Teachers will have to recognize that the present-day view of the road to success and happiness is not the same path they were taught to travel. The Puritan work values of middle-class white Americans do not lie at the foundation of contemporary urban culture. Many young people honestly see no value in pursuing a vocation in the manner that has been taken for granted by the majority of Americans of previous generations. They may find that employers are not particularly receptive to their viewpoint. Polarization is inevitable if handicapped, disadvantaged or any other class of worker seeks pay for work he does not do. The worker must be worthy of his hire. Every job fit for human performance should have some aspects or episodes that are challenging, stimulating and goal setting. Not every job can provide self-fulfillment but each can contribute steps along the way.

The geographic region incorporated in the model contained in this study is currently suffering serious unemployment or under-employment, a condition which could become chronic. The stability of the economy of the region, at least for the foreseeable future, is dependent upon the continued operation of at least the equivalent of existing manufacturing industries. New industries are needed, a condition that is also true throughout the Commonwealth. There is a need to study the existing occupations of the area, to redefine them, and to develop new categories and combinations that are more appropriate to employment conditions, thus producing a more viable employment situation. The deliberate planning of the make-up and the requirements of occupations to meet the abilities and circumstances of potential employees appears to be a neglected possibility.

Occupations more or less unique to the area should be exploited if such is possible. According to secondary students surveyed in the "model area", (as reported in Section III of this report) it appears that at least 50 percent of those currently enrolled in secondary education will remain in the area permanently. Unless they are prepared for the occupational opportunities existing in the region or unless new ones can be created for which they can be readily trained, then unemployment or under-employment is inevitable. There is no evidence that current high school curricula have been planned with special reference to the existing or predictable employment opportunities. In fact, in many instances, there is little or no awareness of any need or purpose in relating local and regional business and industry to the curriculum.

Disadvantaged youngsters and all others as well, must learn to accept the fact that in this life one must give in order to get. They must understand that employment involves an exchange. It should be a fair exchange. Each party must contribute an appropriate amount, kind and quality of his share of the exchange. The happy balance is sometimes difficult to determine and maintain but it is the best assurance of continuous productivity. No one has yet devised a system by which employment can be guaranteed. There may be times when individuals are unable to find any job, little less the particular type for which they are best suited by interest, temperament and ability. They have to learn that even when they are ready, jobs are not always readily available. Education must contribute to the individual's ability to recognize common factors in jobs; to learn how to adjust readily and appropriately to the variations in techniques within similar jobs; to develop a readiness for retraining; and to develop the habit and skill of continually upgrading one's self in the job.

In summary, schools must launch a direct approach to meeting the occupational needs of academically disadvantaged youth, incorporating the following objectives, among others:

1. To develop effective criteria for identifying academically disadvantaged students.
2. To design programs to meet individual needs of students.
3. To utilize community resources: industry, business, unions, government.
4. To arrange for cooperative work experiences.
5. To develop a program of placement and follow-up.
6. To assist students in building a feeling of personal worth.
7. To develop a program of counseling: compensatory, occupational.

At the same time, however, disadvantaged youth must realize that the worker must search out opportunities himself, must learn the mystique of job hunting. Some ways are more effective than others. There are agencies, institutions and procedures which can be of considerable assistance.

CAREER EDUCATION IN THE SCHOOLS

The current system of directing students toward careers is still inadequate. Parents, teachers and counselors are simply not adequately informed about the employment possibilities open to students. Today's labor market is quite complex and certain minimum skills are essential for those seeking jobs. Rapid technological change is diminishing the need for unskilled workers and the bulk of employment increase is in those occupations which demand certain educational prerequisites. Effective career education encompasses almost everything the schools teach but the problem is that students are not able to get the right combinations and appropriate proportions of each of the subjects offered. Those courses which are directed at occupational education must be an integral part of the overall program. The benefits are seriously diminished when such programs are forced to function in isolation. Where the occupational educator is isolated from both his education and industrial colleagues he is more apt to stress the more "practical" view of training in technique which is out of step with both changing industrial conditions and the personal qualities required for successful job retraining throughout one's working life. The schools have an obligation to relate curriculum offerings to local and area conditions and employment opportunities. Unfortunately, the correlation is low between the existing occupational opportunities and the programs of the schools. The range of applicability of varied skills and the effects on productivity caused by such varied skills, should be the factors determining the content of career education rather than the requirements of given occupations setting these parameters. The key question relating the world of work to the world of learning must be: "How widespread is the demand for a particular skill; in how great a range of jobs can it be applied; and how rapidly is it likely to obsolesce?" Training programs must be suited to both the reality of the employment market and the potentialities of individual students. School authorities must acknowledge the school's social responsibility of preparing youth for entry level positions and in providing the motivation and the academic and technical knowledge which will permit successful retraining throughout the working life of the individual.

This responsibility may be discharged in a variety of ways but whether the goals are achieved through formal educational programs or in the less formal training programs of industry and business, placement in gainful employment remains the ultimate goal of occupational education. As complicated as the assignment may be, the school must help the student to obtain suitable employment upon completion of his schooling. There should also be a follow-up procedure that includes an assessment of job adjustment and some support in aiding the graduate to overcome deficiencies. Vocational counseling per se appears to be an essential ingredient of any effective school placement plan. A placement office within the school is essential. Such an office which works in close and continuous cooperation with representatives of business, industry, unions and the U. S. Employment Security Office should be established in every community or region. This should be a partnership arrangement - a consortium-style concerted effort.

In the analysis of the work situation, the placement officer must evaluate with the candidate current and potential conditions of job satisfaction, interpersonal relationships, opportunities to use talents, non-financial rewards, and job security. Individuals must be made aware of the complexities of the labor market, the options available to them, and peripheral requisites such as presenting themselves in a favorable light, displaying their abilities to communicate and to be literate, as well as possessing the technical skills necessary for work participation. It should also be borne in mind that vocational students, on their own, are less likely than other students to discuss either course choices or occupational plans with a guidance counselor.

It has been impossible for school counselors to keep posted on the trends of the job market. They are in no position to predict in advance what the manpower needs are going to be in any given year. Job opportunities are created by growth in the number employed in a field. The principal source of job opportunities for new workers in most occupations, however, will be the replacement of those who leave their jobs because of death, retirement or other reasons.

One aspect of career education that is seldom mentioned is that which deals with the need for the creation and promotion of new fields of work, the reordering and redefinition of jobs and the extension of services. Advances in technology may cause jobs to become obsolete while creating new opportunities. Some group, more responsible to society than advertising specialists or organizations of either labor or management, must engage in the difficult but essential business of maintaining a satisfactory system of employment forecasting, adjustment in career education, placement and retraining.

CAREER EDUCATION IN NORTH WORCESTER COUNTY

Career education in North Worcester County does not require an additional expensive capital outlay. An impressive program can be established with existing facilities. It may not be possible to provide comprehensive or even adequate programs in each existing elementary school building but there are numerous means for accomplishing the goals that have been set. In these days of open classrooms, there must be numerous ways of either transporting students to a central location or bringing a mobile unit to each elementary school. Very few elementary schools in the North Worcester County region are doing much with career education per se. Pilot schools should be established within each community as soon as possible. In-service courses should be provided for elementary teachers by Fitchburg State College.

In general, the junior high schools of the region have the traditional practical arts facilities. Career education could be extended and improved in every junior high school in the defined region. The standard programs in industrial arts and home economics need revitalizing with more attention given to the clusters described in Section II of this report. If, as reported in Section III, the majority of youngsters who attend their local high schools take up permanent residence there, then much more needs to be done about investigating the career and occupational options in each of the respective high schools along with the local community and adjoining areas.

Physical facilities for career education in the area high schools are minimal to adequate at best. Programs need to be extended beyond traditional woodworking, drawing, printing, business and home economics courses. For the most part, the high school programs within the defined model are not sufficiently comprehensive. Their career relevance is most incidental. Some courses need reorientation; some need additional emphasis on career values. Most programs need the addition of other occupational areas, so that students have exposure to all fifteen career clusters.

When one considers what is known and practiced in our best schools, what is known to researchers, what is advocated by reputable scholars and then compare such data with the content and methods found in too many of our schools, he can only hope for a much more effective diffusion process. Career education must face the need of change systematically or the gap between what is being done and what is possible will always be wider than it need be. Consideration should be given to the likenesses and differences of the programs in the comprehensive high schools and the vocational-technical high schools. They need not be entirely different but they should not be similar either in scope or depth. Work-study programs under the auspices of the regular high school needs further study and implementation. Community resources should be utilized much more than they are. More partnerships of schools with business, industry and labor unions are needed to establish cooperative programs. Much more is needed in career education programs but the route to take is not additional school construction, in most cases. Furthermore, the significance of the graduates residing permanently within the same geographic region should be considered seriously in the development of career education programs. A study should be made of the shortages that abound in certain fields like appliance repair, maintenance, and many other business and industrial establishments and appropriate courses should be instituted to meet the needs of the region.

In too many so-called comprehensive schools, the only program which can accomodate a large number of girls is office-oriented. This is not in consonance with the reality of the labor needs of the marketplace. Placement opportunities through programs in areas such as home economics, distributive education, health-related education programs and newly developed child care programs must also be investigated and viable programs inaugurated. Even the major occupational applications of home economics may be limited in some school programs to domestic services when so many other occupational fields in foods, clothing and sales could be featured. Students with a knowledge of fabrics, of workmanship methods and standards, of quality, of design and of fashion should have job opportunities open to them. For example, in this region, jobs in clothing factories, small businesses in dressmaking and in accessories as well as business opportunities in fabric design and the world of fashion.

A variety of forms of high school work experience existing within the state, some with pay and some without, can be adapted to suit the conditions and the students of this area of the Commonwealth. In addition to the need for coordination of both internal and external work experience, program arrangements should be made for an effective interplay between local high schools and an area career institute as defined and described in the Schaeffer-Kaufman study. Montachusett Tech might serve as a regional center or career institute to provide certain concentrations or even specialization for periods of time which suit the needs and purposes of given students without altering their status at their respective high schools. Work experience can be provided in the community as well as within a given school or school system.

Articulation of the programs at various school levels is essential. There must be opportunity for continuous, progressive development from grade to grade and school to school and beyond, Schools should initiate procedures for collaborating with business, industry and labor unions in establishing a cooperative program of Junior Achievement within the school facilities. This proposal is no invitation for businessmen and industrialists to become disengaged from the educational program. Such a move would be a serious mistake. The partnership approach is essential. Neither the school nor the present form of Junior Achievement operation has done or can provide effectively the kind of occupational education that is needed for the disadvantaged and the handicapped. With the school, business, industry and the labor unions working as partners, it should be possible to provide added dimensions of readiness, timeliness and practicality to the program. Perhaps parts of such a program could be managed during the regular school day, or after the regular school session. Perhaps some parts of the program could benefit from the participation of a parent or older sibling. Their participation along with the school youth could add motivation and seriousness of purpose to the program. Since their influence on the attitudes and outlooks of the youth is considerable, some effort should be made to convince them also that there can be desirable employment opportunities for those who are ready to take advantage of them.

The term, partnership, as used in this text, carries serious implications for those employers in the geographical region contained in the model. If career education is to be effective, employers will have to participate in all aspects of the educational process. They have a responsibility for helping interpret essential information inherent in the occupations in their establishments and to assist in inducting the succeeding generation into productive economic participation.

Employers represent invaluable resources. Schools will have to learn how to utilize effectively these resources for they have application to curriculum and instruction alike. Some teachers may be well informed about business, industry and labor but many are not. Since career education is the responsibility of all teachers, provisions must be made for providing teachers with appropriate information. To this end, employers will need assistance in determining how they might best cooperate. They misunderstand the schools almost as much as the teachers misunderstand business, industry and labor. There are misconceptions, half-truths and prejudices on both sides. Career education cannot be a joint enterprise until a plan is devised for bringing together both teachers and representatives of employers and employees in the cause of developing a cooperative venture in education. The content and the experiences of given occupations are known best to the employer's groups. Knowledge of learners and of the learning process is the special expertise of the teachers. The combination could form a strong instructional team. Through conferences and seminars, plans could be developed for determining the areas to be covered and the formation of teams to prepare materials and to organize programs. Such a proposal is not fanciful. Numerous educational projects have brought these groups together in similar collaborative efforts.

Career education benefits employer as well as employee. Business, industry and labor recognize they have a stake in education. In actuality, they will pay a large portion of the cost anyway. Their investment would bring greater returns if they helped to create stronger programs. Business and industry have expended millions of dollars in their own training programs. They will not fail to recognize their opportunities as well as their responsibilities for developing a dynamic program of career education. Only through such a partnership can a program remain current. What teachers of occupations need in order to achieve their goals will not be obtained from the typical array of in-service courses avilable to them. Instead, the need exists for a renewal and research center, a partnership and a liaison between the schools and the employing agencies, a catalyst and an effective organizing body, a distributor and a generator of instructional resources.

Collaboration would be the policy throughout the entire K-12* program. It would include but would not be restricted to work experience programs as well as on-the-job training. Even trips to business and industry would take on a much greater educational significance as would Junior Achievement programs.

---

*Kindergarten through Grade 12

One thing is certain - a program of career education must be dynamic, particularly at the upper levels where critical decisions are to be made about available options. Occupational information must be current and contemporary. Some notions of the future prospects of a given area of employment should also be assessed. The charge to the school is to know what jobs are available, to understand what they consist of, to realize what changes are in the offing and to prepare programs accordingly. The difficulties of this charge are considerable. First, it will be next to impossible for each local school system, relying on its present personnel, to keep posted on all the jobs of the area and secondly, most teachers will tend to maintain the program they have developed around the objectives and practices of their subjects. Under any banner or movement, individualized instruction or pupil-centered instruction is preached more than practiced. Subject-centered, group instruction in classrooms will continue to dominate until means are instituted for providing the teachers with ready-made instructional materials and devices that facilitate individualized instruction that is up-to-date. To expect the individual teacher to prepare for individualized instruction on a daily basis is a vain and unrealistic dream.

The kinds of data assembled in the Barkley and Dexter Laboratories, Inc., portions of this report have not been available heretofore to organizations and officials planning or directing programs of career education. The process of gathering such data is time-consuming and requires capability in research and appropriate status relationships. In the conduct of this study, it became very evident that a number of agencies and institutions were concerned over the need for the kind of information which would enable them to make reasonable short-range forecasts about employment trends in the area, and to assist school youths and the unemployed in finding jobs. Their efforts are highly commendable and their contribution is invaluable. Yet, there is substantial evidence that no one agency or segment has the staff or the capability to obtain enough of the essential information necessary for functions such as employment forecasting and to provide the kinds of services required for a comprehensive, contemporary program of career education, placement, follow-up and re-education or training.

NEED FOR THE ESTABLISHMENT OF A CENTER

The multiplicity of factors entailed in maintaining an up-to-date program of career education mandates the establishment of some kind of vehicle designed to unify and consolidate the efforts of all those seeking to function in education, training, screening, placement and continued employment or in helping people prepare and find gainful and rewarding employment. Identification of the concerned agencies, an understanding of the role and contribution of each, and the initiation of a plan which would effect cooperation and coordination of effort would result in significant progress.

A great deal could be gained if it were possible to sharpen the focus of each level and segment of the educational component and to achieve greater coordination and articulation among and between schools. Here again, there are many praiseworthy efforts on the part of individual teachers and school officials but there is no available mechanism which enables school systems to keep sufficiently informed about what is happening in the world of work even within the region. Furthermore, there is no existing way for teachers to obtain current information about the procedures and practices of business, industry and labor. Still, educators must acknowledge career education as a bona-fide component of general education and must determine ways of developing integrated and articulated programs within schools and school systems. The establishment of a program in elementary schools is itself a formidable task. There will be complaints about insufficient time in an already crowded program. It is a well known fact that programs in the practical arts subjects have not realized their maximum potential in occupational education. Teachers of these subjects have been admonished consistently to concentrate on their mission in general education. To guard against the error of emphasizing skill training too early in a limited field of occupations, it appeared necessary to de-emphasize the focus on occupational preparation. Comprehensiveness in programs is essential if youth are to be enabled to truly assess their interests and capabilities through realistic, functional experiences.

The goals to be established will undoubtedly be ambitious ones. Oversights and inadequacies are very apt to occur where competition for time, space, resources and personnel are critical.

The relationships between the programs and the teachers of the vocational school and those with occupational overtones in the junior and senior high schools also needs attention. It is essential that more attention be paid to the articulation of courses in the same subject field in the junior and senior high schools. Senior high school courses should be developed with some consideration and recognition of the clusters program of the junior high school. Vocational school programs and senior high school programs should not be in competition, nor should they be that similar to cause such temptation or confusion. The state department of education, colleges featuring teacher education and public school teachers should be brought together in some collaborative effort to facilitate and expedite needed educational changes.

The complexity of the problems inherent in any serious effort to manage the reconstruction of career education even within the restricted geographic area as represented by the model defined in this study suggests the need for the establishment of a Center where data from all concerned and participating agencies can be prepared for distribution, where communications between all parties can be facilitated and where seminars, conferences and courses can be held in all aspects of the program.

RENEWAL CENTER FOR CAREER EDUCATION

Fitchburg State College has already established itself as a logical center for career education. It is engaged in pre-service and in-service teacher education in many areas and all levels of career education. It is ready and has initiated an expansion of its function as a Renewal Center for career education. Toward this end, it has sought to effect the collaboration of government, business, industry, labor and education in revising and updating courses, programs, materials and instructional technology. The college seeks to develop further the system of renewal it has established in teacher education.

The College is also aware of the need for a center of research in career education. It would be a logical step to continue the program in which the College collaborated with Barkley & Dexter Laboratories, Inc., as reported in this study. The parameters and patterns have been defined and with a modest addition of staff the college should be able to continue to work with the various agencies and institutions in assembling and tabulating pertinent data for effective education and placement. Serious commitment to this function calls for the full time assignment of personnel to the function of research and development in this area.

Fitchburg State College, since its founding over 75 years ago, has been committed to a realistic approach to education and has been engaged almost as long in the preparation of teachers of the practical arts. The College has learned from experience that a dynamic teacher education program entails leadership in curriculum making and innovative practice in every aspect of instruction. An institution engaged in career education must perforce make pertinent inquiry into fields and conditions of employment. There must be a reasonable degree of collaboration with a consortium of agencies, institutions, labor unions, business and industrial establishments and the College on matters which range from curriculum, instructional experience and part-time employment, to long-range planning. There must be an earnest effort made to conduct research bearing directly on the factors which determine the employment picture for those youngsters who will be seeking such employment upon leaving school. This type of research requires a degree of sophistication and funding. It requires staff and is not a part-time affair nor a low-priority item. It is indeed appropriate that the location for such a center would be a college or university. The research model has been created through the Barkley & Dexter Laboratories, Inc., study. This model can be replicated and extended to other sections of the state and nation. But the original project should be kept active and current. New developments can then be fed into other projects in the field of career education and in related fields.

SCOPE OF CAREER EDUCATION CENTER

It is vital that in the proposed Career Education Center teachers of occupational and career programs should establish an Instructional Materials Resource Center. Such a center would serve to develop and test instruction systems involving faculty-centered instructional activities and student-centered learning activities.

Within such a center it should be possible to:

1. Create and test new instructional strategies.
2. Field test the instructional materials and systems it distributes.

The personnel of the center should include individuals from the college, the State Department of Education, the schools, business and industry. Each member of the partnership must play the role it can play best: each must respect and reinforce the unique capacities of the other members. The best role of each has really not been fully determined. The obvious may not be the best. The evaluation of present programs and the development of possible answers should be the full-time responsibility of a small, able staff freed from other administrative or teaching duties. The research-action continuum on which this staff would operate may be best illustrated by the accompanying chart. (See Figure I)

This study has investigated productive ways of serving the occupational needs of the handicapped and disadvantaged. The special needs of these target groups may be met through specialized programs and by adjustments to regular programs. But, if

THE RESEARCH-ACTION CONTINUUM[1]

	Research	DEVELOPMENT		DIFFUSION		ADOPTION	
		INVENTION	DESIGN	DISSEMINATION	DEMONSTRATION	INSTALLATION	INSTITUTIONALIZATION
Objective	To advance knowledge	To formulate a solution to an action problem	To render the formulated solution into adoptable and adaptable forms	To create widespread awareness of the invention	To afford an opportunity to examine and assess operating qualities of the invention	To adapt the invention to an adopting school	To render the invention into an integrated and accepted component of the school
Criteria	Validity (internal and external)	Feasibility, viability	Performance, flexibility, generalizability	Fidelity, pervasiveness, impact	Credibility, convenience, lack of bias	Effectiveness and Efficiency	Continuity valuation support
Relation to Change	Provides basis for innovation	Produces the innovation	Engineers and Packages the innovation	Informs about the innovation	Builds conviction in relation to the innovation	Operationalizes the innovation	Regularizes the innovation -- converts it into a "non-innovation"

1. Egon Guba, "Methodological Strategies for Educational Change" (Columbus: 1965) The Ohio State University (mimeographed)

FIGURE I SCOPE OF A CAREER EDUCATION CENTER

a comprehensive (K-14)* program in career education is developed, a considerable amount of it would be appropriate to these groups. In fact, they could be accommodated, to their advantage, with other classes. However, every arrangement made should be the result of a studied effort to determine the most appropriate experience for each class, group or individual.

Fitchburg State has the largest undergraduate program of teacher education for the handicapped in New England and is the "granddaddy" of the institutions of the region in the teaching of practical arts and the preparation of teachers of industrial arts and vocational education. Programs in occupational education in grade Kindergarten through Grade 9 and for the handicapped and disadvantaged are in the process of development at McKay Campus School. High school and community college programs are also being developed. An EPDA** program designed to meet the needs of administrators of career education programs has been piloted at Fitchburg State. A Career Education Center established at the College should serve to intensify the activity and the output which is already producing some significant results in furthering the growth, the direction and the quality of career education in the Commonwealth of Massachusetts.

PARTNERSHIPS

The concept of a partnership between educators and employers is fundamental. There must be an effective inter-relationship;

---

*Kindergarten through Junior College
** Educational Professional Development Act

there must exist a continuous flow of information and a coordination of activities. A viable partnership such as is being proposed in this report is a complex matter. It entails the establishment of cooperative relationships between and among governmental agencies, between and among industrial and business establishments as well as the respective labor unions representing their employees, and between and among educational agencies and institutions. Out of these more limited partnerships, which are difficult enough to achieve, the larger partnership which encompasses all of these entities will be built. There are several state agencies making a significant contribution to career education or engaged in collecting and processing statistics about employment opportunities and about the labor market which is vital to a sound program of career education. In the conduct of this study, Fitchburg State College, along with the Barkley & Dexter Laboratories, Inc., has consulted with several government agencies and their input is significant.

Such partnerships and sharing must be continually fostered and developed. Adjustments in any program of career education will be required periodically, if not annually, in order to keep pace with conditions of employment and developments within business, industry, and labor. Facts and figures from all agencies and institutions will have to be gathered and interpreted through the collaboration of all parties and could be coordinated through the proposed center.

CENTER FOR RESEARCH AND RENEWAL

This proposed Center for research and leadership development in career education would be regionally-oriented and would conduct research, development, training and dissemination activities which impact on significant problems in the occupational preparation of the region's labor force.

Through such a Career Education Center devoted to research and renewal, Fitchburg State College may well be eminently suited to be a bridge between the schools and the job market, a generator and disseminator of many of the instructional programs and resources - in a word, a Center where Career Education will be nurtured and the products disseminated for the benefit of many vitally interested parties throughout the Commonwealth of Massachusetts and in this region of the United States.

SECTION II

RESEARCH STUDY

Barkley & Dexter Laboratories, Inc.
50 Frankfort Street, Fitchburg, Massachusetts

TABLE OF CONTENTS

Page

FOREWORD

ACKNOWLEDGEMENTS

TRAINING FOR WHAT JOBS? WHEN? WHERE? 1

CHARACTERISTICS OF THE MODEL (GEOGRAPHICAL REGION) 2

FIGURE 1 - NORTHERN WORCESTER COUNTY (MAP OF AREA) 3

TABLE I - POPULATION, AREA AND DENSITY 4

DETERMINATION OF FUTURE EMPLOYMENT OPPORTUNITIES: 5

EMPLOYER SAMPLING ON FUTURE EMPLOYMENT PLANS 5

TABLE II & III - CURRENT EMPLOYMENT OPPORTUNITIES FOR OCCUPATIONALLY DISADVANTAGED 7

TABLE IV - ESTIMATED EMPLOYMENT OPPORTUNITIES FOR OCCUPATIONALLY DISADVANTAGED - 1976 9

OFF-THE-RECORD 10

EMPLOYEE OBSERVATIONS 13

ECONOMIC FACTORS PRODUCING JOB OPPORTUNITIES 14

ADDITIONAL LOCAL SOURCES OF FUTURE JOB OPPORTUNITIES 14

CHARACTERISTICS OF THE MODEL - POPULATION 15

FIGURE 2 - POPULATION PROJECTION 16

TABLE V - 5 YEAR POPULATION PROJECTION 17

OCCUPATIONALLY DISADVANTAGED - (HANDICAPPED) 18

TABLE VI - MENTALLY RETARDED POPULATION 19

DISADVANTAGED 20

TABLE VII - ANALYSIS OF NORTHERN WORCESTER COUNTY - POPULATION - 1970 & 1976 21

FIGURE 3 - ESTIMATED MINORITY GROUP PERSONNEL REQUIRING TRAINING FOR JOB ENTRY 23

RETURNING VETERANS 24

TABLE OF CONTENTS Page

FIGURE 4 - RETURNING VETERANS 25

INDUSTRY EMPLOYMENT AND THE ECONOMY 26

OTHER SOURCES OF EMPLOYMENT DATA 26

ECONOMIC GROUPING OF DATA 27

MANUFACTURING 28

FIGURE 5 - EMPLOYMENT PROJECTION (MANUFACTURING) 30

CONSTRUCTION 31

FIGURE 6 - NEW DWELLING UNITS (PROJECTED) 32

TABLE VIII - SUMMARY REAL ESTATE CONSTRUCTION (1972-1977) 33

FIGURE 7 - EMPLOYMENT PROJECTION (CONSTRUCTION) 37

TRANSPORTATION & UTILITIES 38

FIGURE 8 - NORTHERN WORCESTER COUNTY ROAD SYSTEMS 39

TABLE IX - SAMPLING - RESIDENCY VERSUS PLACE OF EMPLOYMENT 40

UTILITIES 42

FIGURE 9 - KILOWATT HOURS (PROJECTED USE) 43

FIGURE 10 - EMPLOYMENT PROJECTIONS - (TRANSPORTATION AND UTILITIES) 44

TRADE - (WHOLESALE AND RETAIL) 45

FIGURE 11 - EMPLOYMENT PROJECTIONS (TRADE) 46

FINANCE, INSURANCE AND REAL ESTATE 47

FIGURE 12 - EMPLOYMENT PROJECTIONS (FINANCE, INSURANCE AND REAL ESTATE) 48

SERVICE AND MISCELLANEOUS 49

FIGURE 13 - EMPLOYMENT PROJECTIONS (SERVICE AND MISCELLANEOUS) 50

TABLE OF CONTENTS

Page

TABLE X - MOTOR VEHICLES (NORTHERN WORCESTER COUNTY) 51

MOTOR VEHICLES - GRAPH OF TABLE X 52

GOVERNMENT 55

FIGURE 14 - EMPLOYMENT PROJECTIONS (GOVERNMENT) 56

AGRICULTURE 57

FIGURE 15 - EMPLOYMENT PROJECTIONS (AGRICULTURE) 59

APPLICATION LOCAL EMPLOYMENT MODEL 61

TABLE XI - TOTAL EMPLOYMENT BY INDUSTRY 62

TABLE XII - WORK FORCE/POPULATION/EMPLOYMENT 1968-1976 64

EMPLOYMENT OF OCCUPATIONALLY DISADVANTAGED 65

TABLE XIII - EMPLOYMENT BY MAJOR OCCUPATIONAL GROUPS 1970-1976 66

FUTURE JOB OPPORTUNITY INFORMATION 67

EMERGING OCCUPATIONS 70

CONCLUSIONS AND RECOMMENDATIONS 73

APPENDIX A - OCCUPATIONAL CLUSTERS
EXPLANATION OF TERMS 75-95

APPENDIX B - DEFINITIONS OF HANDICAPPED AND DISADVANTAGED 96-99
GLOSSARY OF TERMS 99-100
APPENDIX C - QUESTIONNAIRE 101-103

APPENDIX D - STANDARD INDUSTRIAL CLASSIFICATION - 1967 104-109

APPENDIX E - OCCUPATIONAL TITLES IN THE MATRIX 110-115

APPENDIX F - ACKNOWLEDGEMENTS CONTINUED 116-118

APPENDIX G - BIBLIOGRAPHY AND DATA SOURCES 119-122

ACKNOWLEDGEMENTS

Information was derived from a large number of government, private and commercial sources. Particular acknowledgement should be given to:

Over 100 employers in North Worcester County who gave generously of their time and talent.

President James J. Hammond, Dr. Lawrence Ovian, Dr. Francis X. Guindon and the staff of Fitchburg State College.

The several offices of the Commonwealth and Federal Government and particularly the Department of Employment Security, Occupational Research Department.

Additional acknowledgements are cited in Appendix F.

A RESEARCH STUDY OF THE HANDICAPPED/DISADVANTAGED IN NORTHERN WORCESTER COUNTY LEADING TO A PILOT PROGRAM IN OCCUPATIONAL EDUCATION AND CAREER DEVELOPMENT

TRAINING FOR WHAT JOBS? WHEN? WHERE?

Occupational education and career development programs to be meaningful must have prerequisites based on the actual job opportunities which exist in a given geographical region. Coincident with the successful accomplishment of any proposed training, information must be specific in terms of a future point in time.

Thus, the objective of this study is to set up a method for determining the employment opportunities in the future; one year, three and five years, and demonstrate the application of the model using a specific geographical region. In addition, an examination of the characteristics and number of Occupationally Disadvantaged and the relationship to future training programs is also presented.

DETERMINATION OF FUTURE EMPLOYMENT OPPORTUNITIES:

The determination of future job employment opportunities for the occupationally disadvantaged, (handicapped[1] and disadvantaged[2]) in the model was accomplished by first examining the parameters which have an effect on all employment opportunities in the area.

1/ Handicapped-definition-See Appendix B

2/ Disadvantaged-definition-See Appendix B

In general, three different but complimentary approaches were employed to ascertain the relevant data, viz:

1. Sampling of specific information on future employment plans by interviews and discussions with knowledgeable people on the local scene.
2. Examination of Economic information which produces an effect on growth and associated employment opportunities exemplary of the model.
3. Relating the national and state data and forecasts to the local model.

CHARACTERISTICS OF THE "MODEL"

Geographical Region

The "model" chosen to demonstrate the method encompasses the 23 cities and towns in Northern Worcester County. This includes urban areas, highly industrialized zones, rural regions and residential towns. See Figure 1. Because of this diversification, the model displays characteristics which are typical of those found in other regions of the state of Massachusetts as well as many parts of the nation.

FIGURE I

NORTH WORCESTER COUNTY

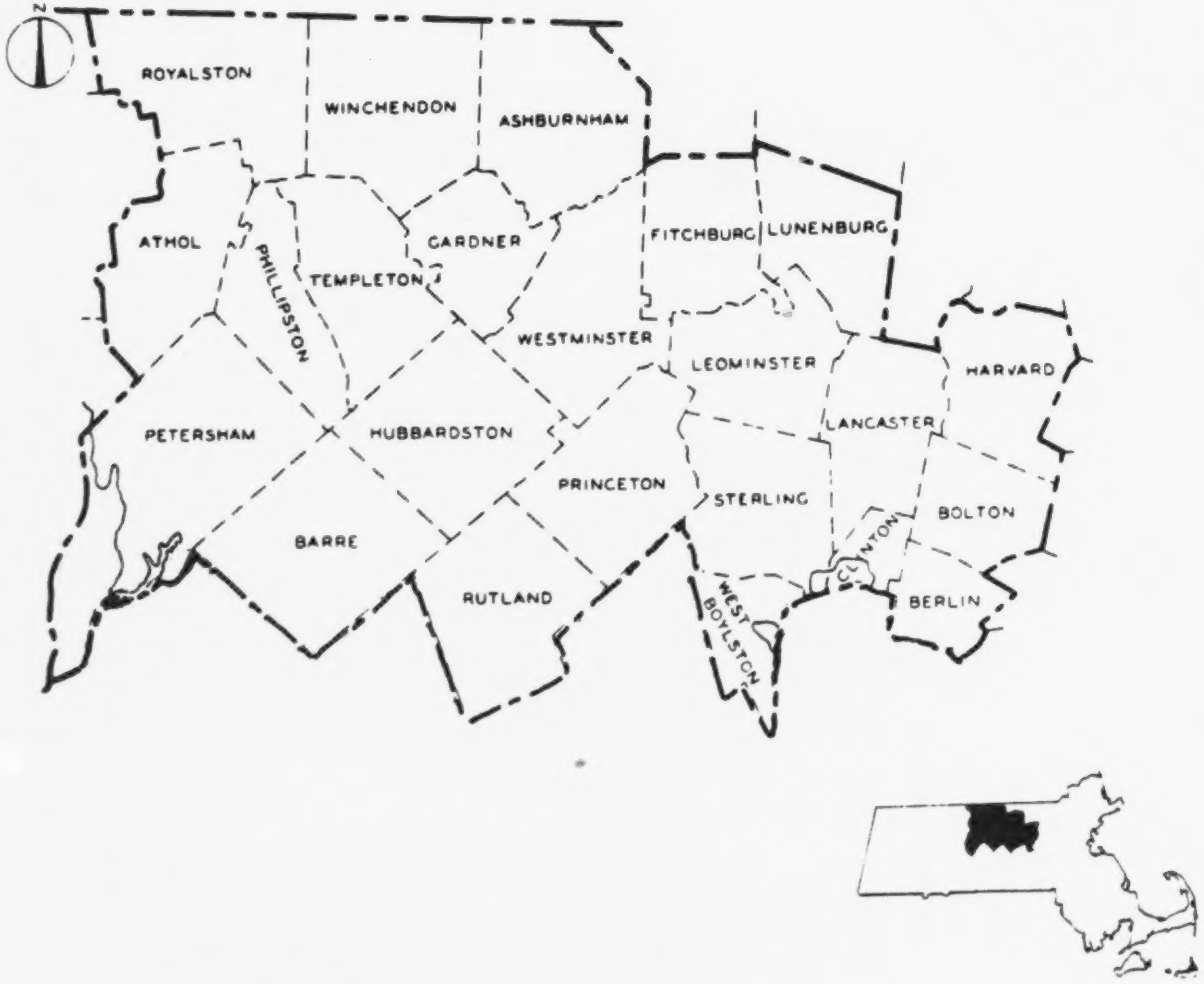

N
ROYALSTON
WINCHENDON
ASHBURNHAM
ATHOL
PHILLIPSTON
TEMPLETON
GARDNER
FITCHBURG
LUNENBURG
WESTMINSTER
LEOMINSTER
HARVARD
PETERSHAM
HUBBARDSTON
LANCASTER
PRINCETON
STERLING
BOLTON
CL NTON
BARRE
RUTLAND
WEST BOYLSTON
BERLIN

TABLE I

NORTH WORCESTER COUNTY

POPULATION, AREA AND DENSITY

(CITIES are in CAPITALS)

(Density is based on land area)

	1970	AREA IN SQUARE MILES			Density
CITY or TOWN	Population	Land	Water	Total	Persons/Square Miles
Ashburnham	3,484	39.15	1.74	49.89	89
Athol	11,185	32.34	.73	33.07	346
Barre	3,825	44.30	.52	44.82	86
Berlin	2,099	13.01	.17	13.18	161
Bolton	1,905	19.93	.06	19.99	96
Clinton	13,383	5.36	1.85	7.21	2,497
*FITCHBURG	43,343	27.47	.86	28.33	1,578
*GARDNER	19,748	22.02	.82	22.84	897
*Harvard	13,426	26.35	.63	26.98	510
Hubbardston	1,437	40.34	1.37	41.71	36
Lancaster	6,095	27.65	.28	27.93	220
*LEOMINSTER	32,939	28.81	.70	29.51	1,143
Lunenburg	7,419	26.63	.86	27.49	279
Petersham	1,014	54.27	13.91	68.18	19
Phillipston	872	23.70	.59	24.29	37
Princeton	1,681	35.39	.31	35.70	47
Royalston	809	41.99	.44	42.43	19
Rutland	3,198	35.42	.69	36.11	90
Sterling	4,247	30.52	1.10	31.62	139
Templeton	5,863	31.49	.75	32.24	186
Westminster	4,273	35.64	1.46	37.10	120
W. Boylston	6,369	12.69	1.09	13.78	502
Winchendon	6,635	42.43	1.36	43.89	156
TOTAL	195,249	696.90	32.29	738.29	280 AVERAGE

*Total population figures in these municipalities are expanded by the presence of institutional population, students, dependents of military personnel and military personnel in relation to the total municipal population.

DETERMINATION OF FUTURE EMPLOYMENT OPPORTUNITIES:

EMPLOYER SAMPLING ON FUTURE EMPLOYMENT PLANS

An important source of specific future job opportunity information is to be found in the administrative offices and top management cadres of the employing establishments of a community. Most establishments prepare future plans which include short and long range objectives, including labor, capital, and facility requirements. The management of any group is also keenly aware of business opportunities, marketing trends, and consequent employment prospects.

In order to tap the fountainhead of information needed for this study, it was deemed advisable to devise a questionnaire which would enable an interviewer to gather information pertinent to the employment of the handicapped and disadvantaged. The questionnaire which was constructed is illustrated in Appendix C, (Questionnaire).

In order to gain meaningful information it was essential that a rapport be established. To do this two things were imperative:

(1) The employer must be convinced of the integrity of the interviewer. Specific information, if judged proprietary by the employer must be pooled in such a way as to safeguard the source.

(2) The employer must be convinced that the study program will benefit him in the future by providing better trained job applicants.

Completed employer questionnaires were then subjected to review by members of the staff. Occasionally it was necessary to call employers for clarification of statements made to interviewers. At all times these people were most cooperative and expressed great interest in the project.

As the employer questionnaire emerged from staff review the information was standardized in terminology and inscribed on the data cards. The format of these data cards allowed all the information to be reduced for computer input on the standard IBM punched card suitable for an IBM 82 sorter. (See Appendix C)

The choice of employers selected for interview was made on the basis of securing a representative sample from each type of business establishment as well as including different size of organization (large/small) together with geographical dispersion throughout the model. It was found that approximately 60 employing units, covering some 203 different occupations, were sufficient to establish the future trends and requirements. This sampling covered employing units that provide 26% of the total jobs in the model.

When collecting data, an existing or potential job opportunity must be identified whenever possible in terms of the required physical, mental, technical and social skills. As an example:

If standing or walking is not required in a particular job, the identification of this fact as a "sitting only" requirement can relate this occupation to applicants with certain correlating handicaps. It is important to determine the minimal physical and mental faculties required for doing each job. Some 411 job cards were completed.

The overall results of these interviews have been combined with statistical information affecting growth and associated job opportunities in the model. This data is developed and summarized in a later section.

An analysis of the interview data indicates the following:

TABLE II

CURRENT EMPLOYMENT OPPORTUNITIES FOR OCCUPATIONAL DISADVANTAGED

Jobs now held by Handicapped*	Jobs which could be held by handicapped but not currently held***	Jobs held by Disadvantaged*	Jobs which could be held by Disadvantaged but not currently held***
52**	141**	83**	213**

TABLE III

CURRENT EMPLOYMENT OPPORTUNITIES FOR OCCUPATIONAL DISADVANTAGED

Total jobs estimated which could be held by the handicapped (1971)	Total jobs estimated which could be held by the disadvantaged (1971)
540	820

*See Appendix for definition of handicapped and disadvantaged.
**Numbers do not add to total of survey number because some jobs may be occupied by either or both categories.
***Some training preparation is prerequisite.

During 1971, the average unemployment for the model was 6,600. (It is estimated that some 50% of this group, (3,300) may be categorized as disadvantaged)*. During this same period, there were 820 jobs which "could have been filled" by some disadvantaged assuming that solutions to several attendant problems could be found, viz: job entry training, transportation and the high "turnover" rate. Actually in the order of 320 or 39% of these 820 jobs were filled by the disadvantaged.

In effect, during periods of high unemployment, the occupationally disadvantaged must compete with a larger number of job seekers, some of whom have been "laid off" because of job curtailments. Since the latter group can, to a large extent, constitute a group who may be described as "over qualified" for many entry level jobs, it further decreases the chances of the disadvantaged in securing jobs. The conclusion therefore, is that without a continuing increase in the number of job opportunities, entry training by itself is ineffectual.

To some extent the foregoing applies to the handicapped in that their ability to acquire jobs depends not only on their skills but in the competition that exists at any given time among the job seekers. In a few cases it has been noted during the collection of employer data, that the handicapped may have a unique advantage over their competition, for example:

---

*D.E.S. estimates that 50% of the unemployed in Northern Worcester County can be categorized as disadvantaged using their definition. See Appendix B.

blind persons working in photographic film processing; deaf persons working on punch presses or machinery with excessive noise; telephone answering service by an amputee; quality control inspection operations wherein the handicapped have developed one of their remaining faculties to above-average achievement.

The results of this study with respect to future job opportunities in North Worcester County for the handicapped and disadvantaged are as follows:

ESTIMATED EMPLOYMENT OPPORTUNITIES FOR OCCUPATIONALLY DISADVANTAGED 1976

TABLE IV

Total Jobs Estimated which could be held by handicapped (1976)	Total Jobs Estimated which could be held by the disadvantaged (1976)
600	915

OFF-THE-RECORD

During the interviews, "Off-the-record" remarks were encouraged and a diligent effort made to determine the employer's honest opinion of current and future job opportunities, expectation of the educational system, experience and/or possibilities for the handicapped and disadvantaged.

The "off-the-record" remarks were found to fall into two general categories, viz: common opinions, e.g., opinions expressed by a relatively small number.

A majority of employers who have worked with handicapped employees expressed satisfaction with:

JOB PERFORMANCE

ATTITUDE TOWARD JOB

SKILL DEVELOPMENT AS APPLIED TO A SPECIFIC JOB

A comment which appeared more than once is believed to be significant: "Most of them (the handicapped) try harder."

A small minority of employers expressed minor annoyances. For example: The need for special work stations, special transportation problems, the "personal involvement" in the event of job termination.

A RELATIVELY LARGE NUMBER OF EMPLOYERS EXPRESSED THE FOLLOWING CRITICISM WHEN DEALING WITH TRAINEES AND EMPLOYEES IN GENERAL BUT PARTICULARLY WHEN EMPLOYING THE DISADVANTAGED:

1. TARDINESS
2. ABSENTEEISM
3. DO NOT FOLLOW INSTRUCTIONS
4. NEED TO BE TAUGHT BASICS OF READING AND ARITHMETIC MORE THOROUGHLY (MOST PEOPLE CAN READ BUT MANY DO NOT RESPOND ACCURATELY TO WRITTEN OR ORAL INSTRUCTIONS).
5. DON'T MIND ON-THE-JOB TRAINING BUT CANNOT WASTE TIME TEACHING PEOPLE THINGS THEY SHOULD BE TAUGHT IN SCHOOL.
6. NEED MORE INSTRUCTIONS ON BASIC AMENITIES.
7. NEED MORE INSTRUCTIONS IN TECHNICAL SKILLS.

A RELATIVELY SMALL NUMBER OF EMPLOYERS EXPRESSED THE FOLLOWING.

1. Would rather train on the job than take on trainees with too much schooling.
2. Have had bad experience and not interested in "experimenting with personnel."

Another relatively small number, on the other hand, said they had very good experience with hiring of the disadvantaged.

In discussions with several government and private agencies who interface with the disadvantaged, the following is believed to be significant:

"In general" the disadvantaged have an above average number of outside problems which detract from their career development in school, their job entry training and their job performance."

"In the case of many of those coming from an agrarian background, the transition to the rigidity of a factory or business environment is a difficult one. In addition, the planning-responsibility span of attention is relatively short. It is difficult to visualize rewards next year (a better job) for extra work (going to school) this year. When language is a barrier, the problems tend to compound themselves through simple misunderstandings."

All of the foregoing are relevant to the task of job training and career development. All of the foregoing are indications of the communication problems that exist within the business and the other segments of society. Specific examples include:

Most foremen and supervisors are quite effective in their jobs as managers but many could do a vastly better job in their teaching functions, particularly during on-the-job training. Many employers have not availed themselves of the benefits of a closer liaison with the educators and the educational talent in the community.

Many employers feel quite strongly that work attendance, tardiness, job attitude and enthusiasm for progress are educational functions that should be accomplished to a large extent prior to entry into the job market. This can be cited as an indictment of the educational system, the responsibility of the parental units and/or other environmental factors notwithstanding.

EMPLOYEE OBSERVATIONS:

The study occasioned employee discussion of attitude for work. Several attitudes were noted to be common:

(1) "Supervisor does not take time enough to explain job thoroughly".

(2) "I cannot see any advancement".

(3) "I need more schooling".

(4) "Company does not pay enough".

(5) "They don't like me at the plant".

(6) "I have to take time off because of my family problems".

(7) "I have to make a trip to ________ and need more time off".

In summary, a closer working relationship between the members of the business community, the members of the school system and the members of relevant governmental agencies is suggested. Each group has much to benefit from a continual feedback of information and exchange of their particular expertise. It is not enough for the business man to expect the school system or the several government agencies to turn out qualified skilled job applicants. He must participate in defining the specific requirements applicable to the jobs he will provide in the future. Those educators who are responsible for curricula, training programs and reduction to practice, must determine the relevancy of the career development program to future job opportunities. In addition, increasing attention must be directed to the costs expended versus value received.

THE ECONOMIC FACTORS PRODUCING JOB OPPORTUNITIES:

The characteristics of the population, transportation, national and state economy, gross and state national product, business climate, governmental action, educational facilities and tax structure are all influential in producing job opportunities. Within the scope of this study, the parameters of population, transportation, manufacturing, construction, finance, government and agriculture have been analyzed and combined with data developed in other sections. The result is a projection of overall employment opportunities through 1976 as well as specific employment opportunities through the same period.

These parameters are individually treated in subsequent sections.

ADDITIONAL LOCAL SOURCES OF FUTURE JOB OPPORTUNITY INFORMATION FOR ANY MODEL:

In addition to the employer data and published statistical data, a number of sources exist in the community whose aid can be invaluable. These are specifically: Trade organizations, labor organizations, Chamber of Commerce, members of the banking profession, educators and members of the school system, insurance and real estate operators, transportation officials and various members of the governmental bodies and agencies. The success of obtaining meaningful information from these sources obviously depends upon the rapport with the interviewer.

CHARACTERISTICS OF THE MODEL (North Worcester County):

Population:

The total population of the model as well as the detailed component content are considered to be factors in determining present and future job opportunities. The population through its demands for services, participation in capital investment and tax base as well as the number of people competing for jobs (Work Force), has primary bearing on job opportunities.

In projecting a growth rate, several parameters were factored into the growth (or lack of growth) function, viz: Planning of utility companies, real estate and financial institution projections, access to highway and transportation facilities, governmental and tax structure, projected birth/death rates and migration.

An analysis of each municipality in terms of past and projected population trends was made. This information is presented in Table V.

Nine of the municipalities are expected to have a negligible growth rate (5% or less) by 1975. Ten of the municipalities are expected to have a growth rate of 10% or greater. The remaining four are expected to experience between 5 and 10% growth rates.

The integrated results for the North Worcester County Model are shown in FIGURE 2. It can be seen that the rate is slightly greater than that projected for the next five years for the U. S. as a whole based on the 1% per year increase (1971). It is also appreciably greater than the state of Massachusetts which is expected to continue to lag behind the U. S. average.

FIGURE 2

NORTH WORCESTER COUNTY POPULATION PROJECTION

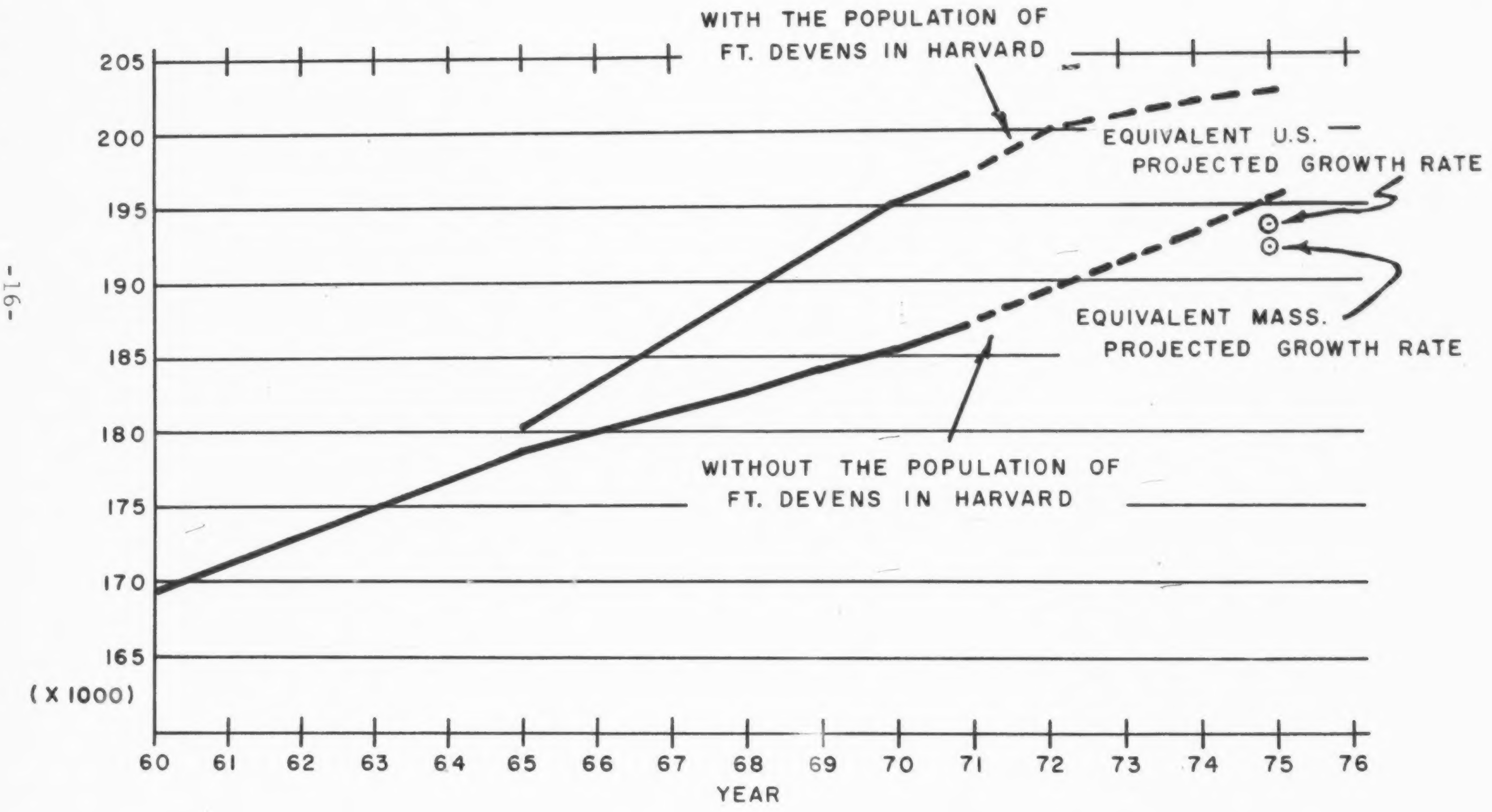


TABLE V

5-YEAR POPULATION PROJECTION (NWC)

Municipality	(1) Population (%) Change 1960-1970	(2) Population (%) Change 1965-1970	(3) Projected Utility (%) Usage/Change 1970-1975	(4) Projected Dwelling Constr.(%)Change 1970-1975	(5) Projected Pop. (%) Change 1970-1975	(6) Population Projection 1975***
Ashburnham	26.3	14.5	16.7	6.7	15	4,006
Athol	3.9	- 6.7	8.8	2.1	< 1	11,000
Barre	9.9	- 0.1	13.6	2.0	5	4,016
Berlin	20.5	5.8	31.7	6.8	15	2,414
Bolton	50.7	14.1	72.1	21.0	25	2,381
Clinton	4.2	- 1.8	15.0	3.4	1	13,500
Fitchburg	0.7	0.6	16.2	5.0	1	43,500
Gardner	3.7	- 3.5	12.9	3.5	1	20,000
Harvard	423.8	426.5*	25.4	8.7	- 25 Military	(7,500)*
					+ 25 Civilian	(4,283)**
Hubbardston	18.1	5.3	19.4	4.1	8	1,552
Lancaster	54.0	26.5	(with Clinton)	7.4	15	7,009
Leominster	17.9	10.7	21.0	9.8	10	36,233
Lunenburg	17.1	13.5	14.8	5.9	7	7,938
Petersham	13.9	9.9	12.9	4.4	7	1,085
Phillipston	25.5	3.5	(with Templeton)	6.0	3	898
Princeton	23.6	13.0	17.2	14.7	12	1,883
Royalston	1.1	9.5	(with Winchendon)	1.9	6	858
Rutland	1.7	17.8	23.8	11.4	20	3,827
Sterling	33.0	14.4	26.3	13.3	16	4,926
Templeton	9.2	- 6.0	14.8	3.2	2	5,980
West Boylston	15.3	5.1	15.3	11.3	12	7,133
Westminster	6.2	- 4.0	28.8	8.6	5	4,487
Winchendon	6.4	- 0.8	12.1	1.6	< 1	6,600
				Total without Harvard's Ft. Devens personnel		195,519
				Total with Harvard's Ft. Devens personnel		203,019

*Ft. Devens (portion of residences in Harvard)
**Non-Ft. Devens Population
***Projection of 5 year change made in concert with 5 year census data tested in Historical Model.
< Less Than

OCCUPATIONALLY DISADVANTAGED

The Occupationally Disadvantaged in this study are of two major groups; the handicapped and disadvantaged.

HANDICAPPED

A "handicapped person" means mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled, or other health impaired persons who by reason of their handicapping condition cannot succeed in a vocational or consumer and homemaking education program designed for persons without such handicaps, and who for that reason require special educational assistance or a modified vocational or consumer and homemaking education program.[1] See Appendix for additional detail, page 96.

The estimate of Mentally Retarded population for North Worcester County is based on the projection of the National Association for Retarded Children which states that 3% of the general population is retarded. The mentally retarded are further classified as:

Estimates of Retardation of General Population By Degree

Retarded:

Profound (IQ 20) about 1½%
Severe (IQ 20-35) about 3½%
Moderate (IQ 36-52) about 6%
Mild (IQ 53+) about 89%

See Table VI for additional information on the Mentally Retarded in Northern Worcester County.

1/ From Federal Register, Vol. 35, No. 4, Part II, January 7, 1970.

TABLE VI

MENTALLY RETARDED POPULATION

MUNICIPALITY	(1) TOTAL MENTALLY RETARDED 1970	(2) TOTAL UNDER 20 YRS. 1970	(3) TOTAL 20 & OVER 1970	(4) UNDER 20 MILD 1970	(5) SPEC. ED. TRAINABLE EDUCABLE 1970-71	(6) SPEC. ED. HANDI - CAPPED 1970-71	(7) MENTALLY RETARDED 1975	(8) UNDER 20 1975	(9) 20 & ABOVE 1975	(10) UNDER 20 MILD 1975
Ashburnham	105	41	64	37	5	42	116	45	71	41
Athol	336	131	205	118	44	188	330	129	201	116
Barre	115	45	70	40	10	55	116	45	71	41
Berlin	63	25	38	22	1	14	69	27	42	24
Bolton	57	22	35	20	-	5	69	27	42	24
Clinton	401	156	245	140	35	55	405	158	247	142
Fitchburg	1,300	507	793	455	98	195	1,305	509	796	457
Gardner	592	231	361	207	91	287	600	234	366	210
Harvard	403	157	246	141	-	36	418	163	255	146
Hubbardston	43	17	26	15	-	34	45	18	27	16
Lancaster	183	71	112	64	11	11	201	78	123	70
Leominster	988	385	603	346	109	356	1,077	420	657	377
Lunenburg	223	87	136	78	18	125	238	93	74	83
Petersham	30	12	18	11	-	15	32	12	20	11
Phillipston	26	10	16	9	-	-	27	11	16	9
Princeton	50	20	31	18	-	-	56	22	34	20
Royalston	24	9	15	8	5	5	26	10	16	9
Rutland	96	37	59	34	7	7	110	43	71	39
Sterling	127	50	77	44	1	25	144	56	88	50
Templeton	176	69	107	62	12	12	179	70	109	63
West Boylston	191	74	117	67	3	12	203	79	124	71
Westminster	128	50	78	45	9	36	133	52	81	47
Winchendon	199	78	121	70	37	154	198	77	121	69
TOTALS	5,856	2,284	3,573	2,051	496	1,669	6,097	2,378	3,652	2,135

Column 1 based on 3% of population (National Average)
Column 2 based on 39% of Column 1 (National Average)
Column 3 based on 61% of Column 1 (National Average)
Column 4 based on 35% of Column 1 (National Average)
Column 5 School Year 1970-71 (Actual)
Column 6 School Year 1970-71 (Actual)
Column 7 based on 3% of 1975 Projected Population
Column 8 based on 39% of Column 7 (National Average)
Column 9 based on 61% of Column 7 (National Average)
Column 10 based on 35% of Column 7 (National Average)

DISADVANTAGED

The term "disadvantaged individual" as used in this study has been defined by the Manpower Administration, U. S. Department of Labor. The definition is stated as follows:

> A disadvantaged individual is a poor person who does not have suitable employment and who is either (1) a school dropout (2) a member of a minority (3) under 22 years of age (4) 45 years of age or over, or (5) handicapped.

See Appendix B for additional detailed information.

Currently the Department of Employment Security estimates that in North Worcester County 50% of the total unemployment can be classified as disadvantaged.

An analysis of certain characteristics of the population, viz: male, female, age and minority group distributions are shown in TABLE VII.Two factors merit attention: (1) The work force is increasing at a rate somewhat higher than that of the state. Therefore, jobs must be created and job entry training completed at a higher rate than that at state level or the unemployment rate will continue to be higher than the state averages (2) The character of the city population is changing in that the rate of increase of the minority groups is much higher than that of the remainder of the urban population. Presently the minority group rate of increase (non-white and Puerto Ricans) is running between 8 and 10% per year. The bulk of this increase lies with in-migration. The continuance or change in this rate is dependent upon the relative attractiveness of the urban

TABLE VII

ANALYSIS OF NORTH WORCESTER COUNTY

(POPULATION) 185,420 (1970)*

WORK FORCE SOURCE

Total Male 16 to 65 yrs.	52,079*	(28% of total pop.)
Total Female 16 to 65 yrs.	56,342*	(30% of total pop.)
Total 16 to 65 yrs.	108,421*	(58% of total pop.)
Average Number Work Force	73,294	(39.5% of total pop.) (67.6% of pop. 16/65 yrs.)
Average Number Employment	68,824	(37.1% of total pop.)
Average Number Unemployment	4,470	(6.1% of work force)
Average Number Disadvantaged	2,235**	(1.2% of total pop.)

MINORITY GROUP DISTRIBUTION

Non-white Male 15 to 65 yrs	451***
Non-White Female 15 to 65 yrs	549***

Puerto Rican Total - 2,000 to 2,200 average through 1970

WORK FORCE SOURCE 1976

Total Male 10 to 59 yrs	60,179****	(33% total pop.)
Total Female 10 to 59 yrs	61,297****	(34% total pop.)
Total 10 to 59 yrs	122,476****	(67% total pop.)
Work Force (adjusted)	(82,700)*****	

*Corrected to exclude Ft. Devens Harvard Residence Population

**Based on Div. of Employment Security Analysis of North Worcester County, viz: Approximately 50% of unemployed.

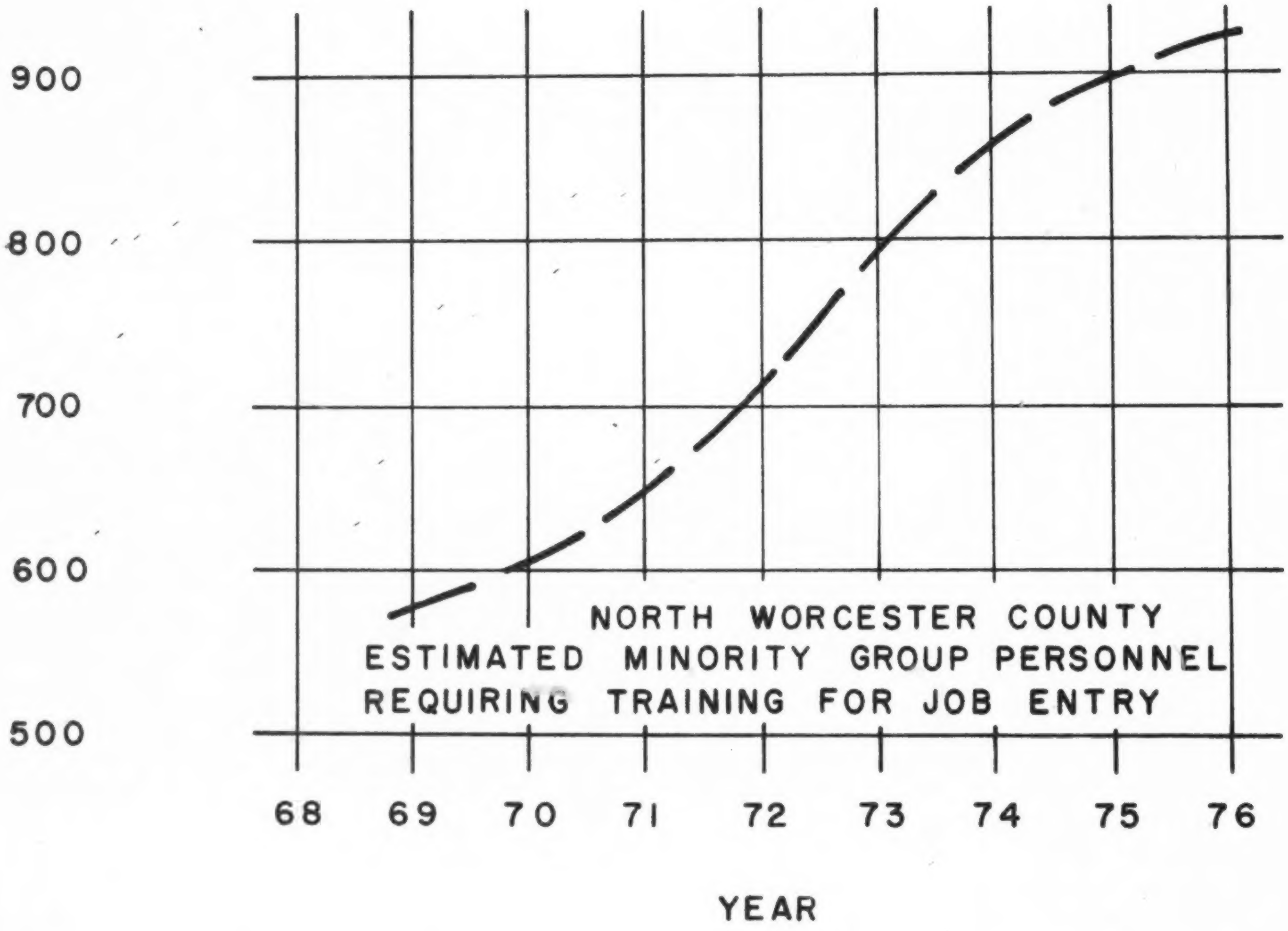
***Census data Negro, Indian, Oriental, Other - Age Group Category 16 not given. (This excludes Ft. Devens Harvard Population but includes students and faculty of Atlantic Union College, Lancaster)

****Work Force Source 1976 (not corrected for mortality or inflow/outflow)

*****Work Force corrected for mortality and inflow/outflow areas of North Worcester County in comparison to regions which are the source of the migration.

FIGURE 3 is a graph of the projected numerical requirements for the number of persons who are members of minority groups and who may require training for job entry during the next five years.

FIGURE 3

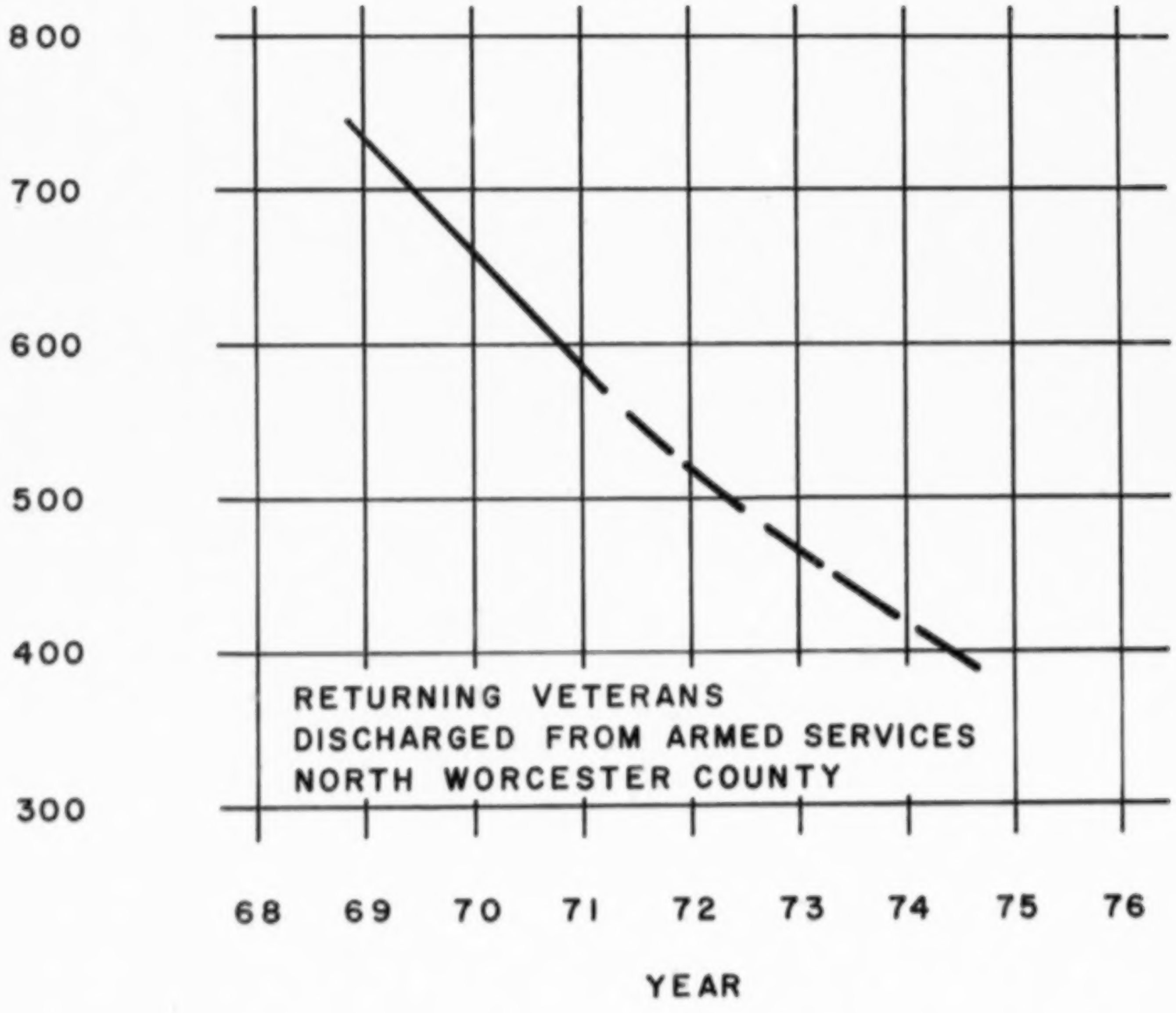


NORTH WORCESTER COUNTY
ESTIMATED MINORITY GROUP PERSONNEL
REQUIRING TRAINING FOR JOB ENTRY

RETURNING VETERANS

FIGURE 4 is a plot showing the number of returning veterans in North Worcester County based on the present posture of the Armed Forces requirements. During their period of enlistment some servicemen have acquired skills which are useful in civilian life. Still others lack these employable skills. Somewhere in the order of 1/4 of the presently returning veterans require specific job training.

FIGURE 4


800
700
600
500
400
300
RETURNING VETERANS
DISCHARGED FROM ARMED SERVICES
NORTH WORCESTER COUNTY
68
69
70
71
72
73
74
75
76
YEAR

INDUSTRY EMPLOYMENT AND THE ECONOMY

Specific employment opportunities within the model are closely related to the local economy. This in turn is dependent on the prosperity (or lack of it) in the state and in the nation. In some segments of the economy this dependency is direct and almost total. In others the relationship is remote and in some cases completely out of time phase with respect to the state and national levels.

In the preceding sections, information has been developed relative to local employment opportunities. This information has been pooled and grouped by major industry (or activity) for comparative analytical purposes.

OTHER SOURCES OF EMPLOYMENT DATA

Historical employment information is available from several sources: Census information, (both municipal, state and federal government), Division of Employment Security, Department of Labor and Department of Commerce statistics. Municipal census data is published in city directories or available at the town hall. Federal census data is available from the U. S. Department of Commerce.

The data produced by the Massachusetts Division of Employment Security, as well as certain information from the Department of Commerce, is presented by S.I.C.* groupings which may consist of a two, three or four digit code depending upon the depth of definition. These numbers describe a specific business classification, e.g., S.I.C. 27, printing and publishing: S.I.C. 279, printing trades, S.I.C. 2791, typesetting.

---

*Reference: Standard Industrial Classification Manual, Bureau of Budget, 1967 edition. See Appendix D.

ECONOMIC GROUPING OF EMPLOYMENT DATA

For the purposes of analyzing economic conditions, the S.I.C. codes are grouped into two-digit categories.

S.I.C. CODE	INDUSTRY
(19-39)	MANUFACTURING TOTAL
	Durable Goods
	Non-Durable Goods
(15-17)	CONSTRUCTION
(40-49)	TRANS. & PUBLIC UTILITIES
(50-59)	TRADE
(60-67)	FINANCE, INSURANCE, REAL ESTATE
(70-89)	SERVICE & MISCELLANEOUS
(91-94)	GOVERNMENT
(01-10)	AGRICULTURE

Since these employer or SIC groupings are made in accordance with the major activity of the business, it is possible for certain job groupings or occupations to be divided between two or more employer groupings. Probably one of the outstanding examples of this is the occupation, auto mechanic, where relatively large numbers may appear in Trade (Wholesale/Retail) totals because the employer sells automobiles. Others will be included in Transportation because they repair buses or trucks and the employer is functioning mainly in Transportation. Additional mechanics are employed in the (Service industries) ie., Garages and Service Stations.

An analysis of each of the above cited categories is presented in the following sections together with a corresponding employment projection based on all of the information available within the model.

MANUFACTURING:

Manufacturing has been responsible for the largest segment of employment within the model. Economically, it is a most desirable segment because:

(1) It generates "export income", i.e. the productivity brings money into the model.

(2) The pay scale in many manufacturing operations is above that in other segments of commerce.

(3) There is a greater variety of job opportunities in manufacturing than in other areas.

Career opportunities include not only a variety of production, assembly and machine operators but all phases of office work, transport and distribution activities and technical aides.

Unfortunately the number of these job opportunities has steadily diminished in North Worcester County over the past several years. As with the State of Massachusetts, manufacturing operations in the mode have declined along with the national economy. Unfortunately, for the past five years, manufacturers in Massachusetts have experienced a higher unemployment rate than the U. S. average. The unemployment rate in North Worcester County is currently exceeding the average for Massachusetts. With the reduction in the number of jobs available, the disadvantaged and the handicapped find increasing competition for job openings.

Two conclusions can be drawn: (1) career development and job training must yield personnel with marked improvement in productivity.

This is judged to be the prime responsibility of the education system (2) More jobs must be available if the output of present and future planned training systems are to be absorbed.

Listed below is a breakdown of manufacturing employment by major industries for 1970. FIGURE 5 is a projection of employment in the model and is based on the assumption of moderate improvements in the business climate of Massachusetts.

MANUFACTURING EMPLOYMENT

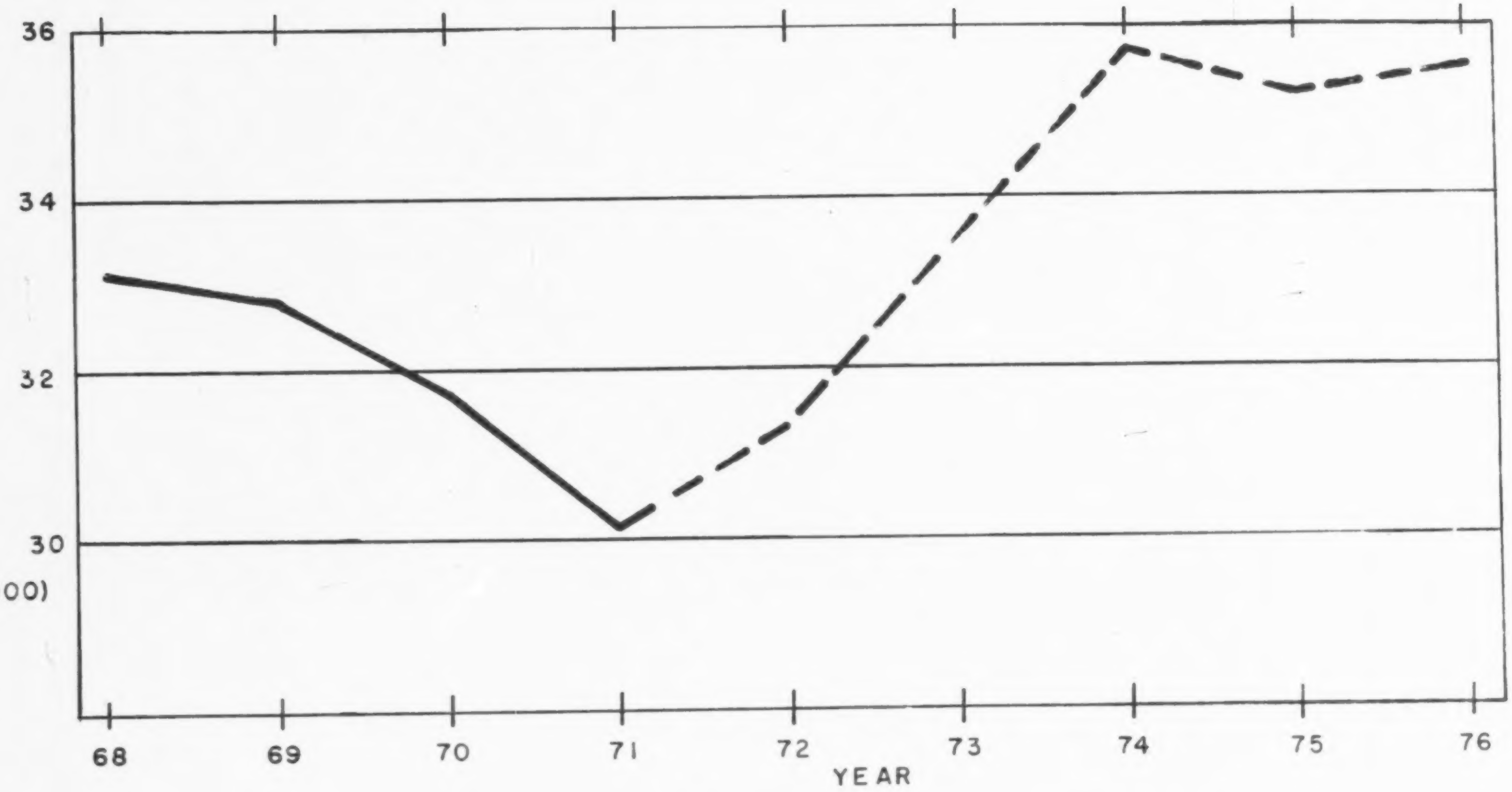
-1970-

SIC CODE	INDUSTRY	TOTAL EMPLOYMENT
	DURABLE	
19	ORDNANCE & ACCESSORIES	291
24	LUMBER & WOOD PRODUCTS EC. FURNITURE	752
25	FURNITURE & FIXTURES	3,716
32	STONE, CLAY, GLASS, CONCRETE PRODUCTS	66
33	PRIMARY METAL INDUSTRIES	745
34	FABRICATING METAL PRODUCTS EC. ORDNANCE MACH., TRANS. EQUIP.	2,490
35	MACHINERY, EC. ELECTRICAL	5,690
36	ELECTRICAL MACHINERY, EQUIP., SUPPLIES	1,124
37	TRANSPORTATION EQUIPMENT	16
38	PROFESSIONAL, SCIENTIFIC INSTRUMENTS, PHOTOGRAPHIC, OPTICAL GOODS	155
39	MISC. MANUFACTURING INDUSTRIES	1,214
	NON-DURABLE	
20	FOOD & KINDRED PRODUCTS	557
22	TEXTILE MILL PRODUCTS	980
23	APPAREL, OTHER FINISHED PRODUCTS MADE FROM FABRICS & OTHER MATERIALS	1,145
26	PAPER & ALLIED PRODUCTS	2,551
27	PRINTING, PUBLISHING, ALLIED INDUSTRIES	2,141
28	CHEMICALS, ALLIED PRODUCTS	920
30	RUBBER, MISC. PLASTIC PRODUCTS	5,801
31	LEATHER, LEATHER PRODUCTS	681
	TOTAL MANUFACTURING	31,035*

*Employment reported By D.E.S. for wage and salary workers only.

FIGURE 5

NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION
MANUFACTURING



CONSTRUCTION OCCUPATIONS:

Building Activity as a Source of Job Opportunities

A large number of the job opportunities associated with the vocational trades are dependent on building activity. An understanding of the potential growth in the construction segment of the economy is essential for planning career development programs.

In the initial determination of what future construction in Northern Worcester County would be, the assembly of data pertaining to the towns involved was undertaken. The manner in which this was accomplished was by personal interviews in each town, data provided by the 1950, 1960 and 1970 census, monographs of each town, building permits issued by the towns and cities, and interviews with other individuals in certain specialized fields.

Many factors were involved in determining the projected growth: The proximity of the community to new highways; projected population growth; land availability in relation to location and past performance. Generally speaking, there has been an upward trend in dwelling units constructed. This increase is based on both increased population and in the case of single residences, fewer occupants per dwelling unit. There have been peak years in construction followed by lean years. The lean years are really absorption periods.

A range of projected dwelling units to be constructed has been given in Figure 6 and Table VIII. The year 1971 was a peak year for new residential construction. Probably 1972 and 1973 will be somewhat leaner years to absorb the 1971 production; followed by 1974 or 1975 as another peak period.

FIGURE 6

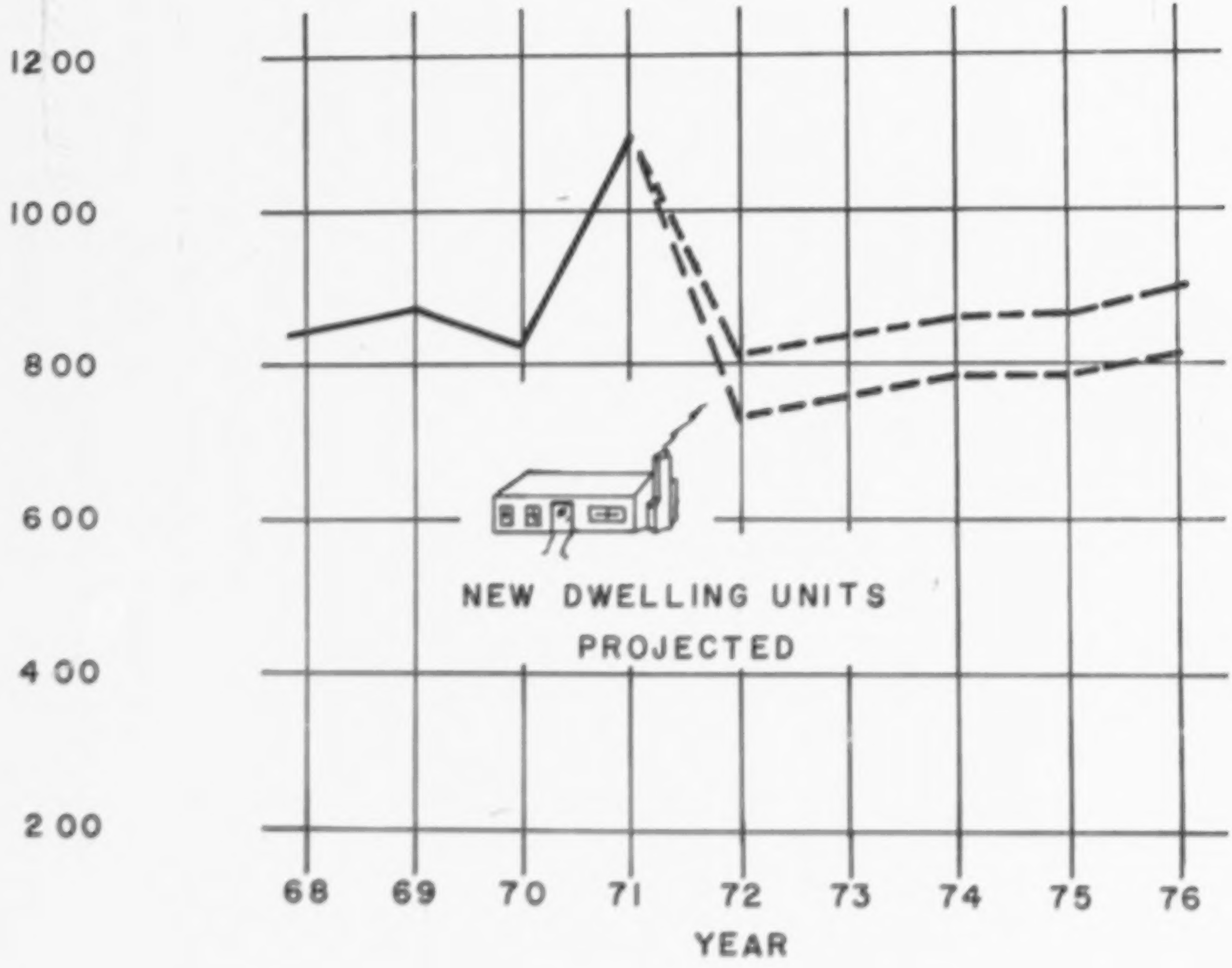

1200
1000
800
600
400
200
68
69
70
71
72
73
74
75
76
YEAR
NEW DWELLING UNITS
PROJECTED

TABLE VIII
SUMMARY OF REAL ESTATE CONSTRUCTION FOR NORTHERN WORCESTER COUNTY 1972-1976

Projected Dwelling Unit Growth	1972	1973	1974	1975	1976
Ashburnham	20	20	21	22	22
Athol	18	17	18	16	18
Barre	5	5	5	5	5
Bolton	24	24	24	24	24
Berlin	8	8	8	8	8
Clinton	30	30	30	30	30
Fitchburg	150	150	150	150	150
Gardner	35	40	45	50	55
Harvard	40	40	40	40	40
Hubbardston	4	4	4	4	4
Lancaster	25	26	27	28	29
Leominster	175	200	210	210	220
Lunenburg	30	30	30	30	30
Petersham	3	3	3	3	3
Phillipston	3	3	3	3	3
Princeton	15	15	15	15	15
Royalston	1	1	1	1	1
Rutland	25	25	25	25	25
Sterling	35	35	35	35	35
Templeton	10	10	11	11	12
West Boylston	40	40	42	42	42
Westminster	25	26	27	27	30
Winchendon	7	7	7	7	7
Total (Low Projection)	728	759	781	786	808
(High Projection)	801	835	860	865	889

*Residential Cost Estimate	*Additions & Alterations Cost Estimate	Non-Residential Cost Estimate	Grand Total
$14,560,000	$17,472,000	$25,000,000	$57,032,000
15,180,000	18,216,000	25,000,000	58,396,000
15,620,000	18,744,000	25,000,000	59,364,000
15,720,000	18,864,000	25,000,000	59,584,000
16,160,000	19,392,000	25,000,000	60,552,000

* Estimate on low projection.

Additions and alterations (cost estimates) were based mainly upon the future dwelling unit construction and the generally accepted fact that this figure usually exceeds the residential construction. In this case, it has been estimated at 120% of the residential construction.

Considering non-residential construction, an analysis of construction permits in the past indicates new industrial building activity occurs during years in which industrial capital expenditures are high. During depressed periods, activity is largely confined to refurbishing and renovating. Other areas of construction activity such as school building, recreational facilities, shopping centers are unrelated to the time occurrence of periods in economic prosperity.

Contributing to construction activity in the recent past were a number of extraordinary situations. For example: regional schools, civic centers, municipal facilities, state college facilities. It is expected that this will continue, viz: Mt. Wachusett Community College at Gardner and Fitchburg State College. Other areas of anticipated activity in the non-residence construction field include Rutland, Westminster and Bolton.

Through the years, real estate trends have been just as prevalent as social trends. Some of these trends become permanently entrenched within the real estate field while others are short-lived yet leave their mark as cornerstones of our times.

In prognosticating what trends will be appearing in the next five years, we have given great weight to what is now happening in the real estate construction field. The majority of the trends to be mentioned will become permanent changes in the real estate construction sector; yet modified as their development continues.

Probably, the most predominant and important breakthrough in construction is unitized or component construction which will tend to reduce the on-site labor. Included in this trend are modular, precut, and prefabricated construction. Educational curricula which prepare students for the construction field should update the program in terms of these new methods and techniques.

Other trends of construction in no order of importance will be environmental control especially in the areas of river pollution, sanitary sewer systems and solid waste disposal.

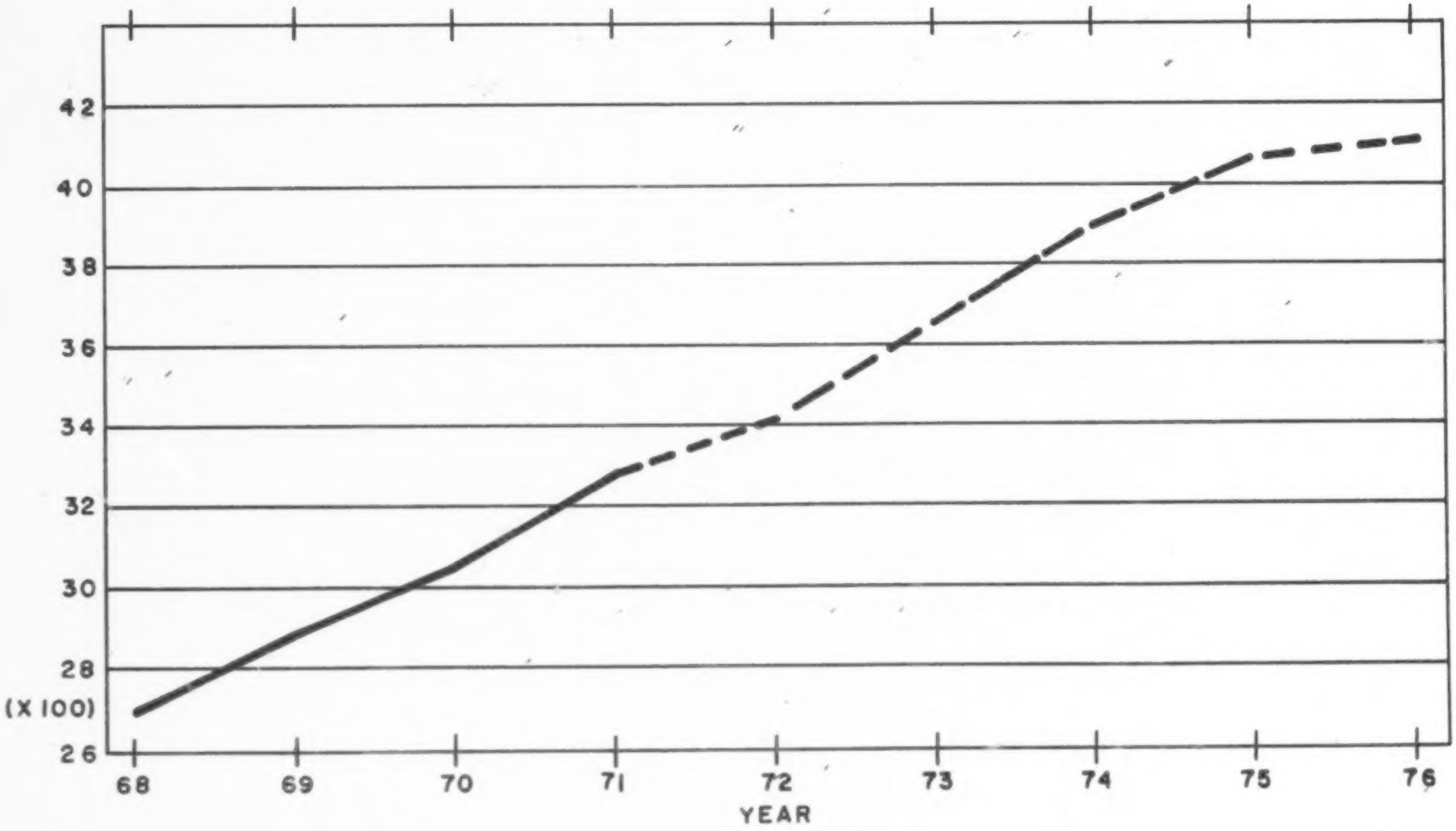
As the upgrading and recycling of existing land becomes more in use, demolition of existing buildings will also grow.

Renovation, rehabilitation and upgrading of buildings will also continue. Strong demand for current design will prevail. Also, people are finding that air conditioning is becoming a necessity rather than a luxury so that the installation of air conditioning units will become more prevalent (hence, an increasing demand for servicemen in this specialty). If school systems become twelve-month orientated, the buildings will have to be air conditioned.

Other areas considered which have a direct bearing on future job opportunities include Schools, swimming pools, recreational facilities, trailer pads, fast food restaurants, buried utility lines, gas stations, specialized auto service centers, apartments, condominiums, burglar/fire alarm systems and sprinkler systems.

The projected total employment by employers whose S.I.C. code falls in "Construction" is shown in Figure 7.

FIGURE 7
NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION
CONSTRUCTION



TRANSPORTATION AND UTILITIES:

TRANSPORTATION:

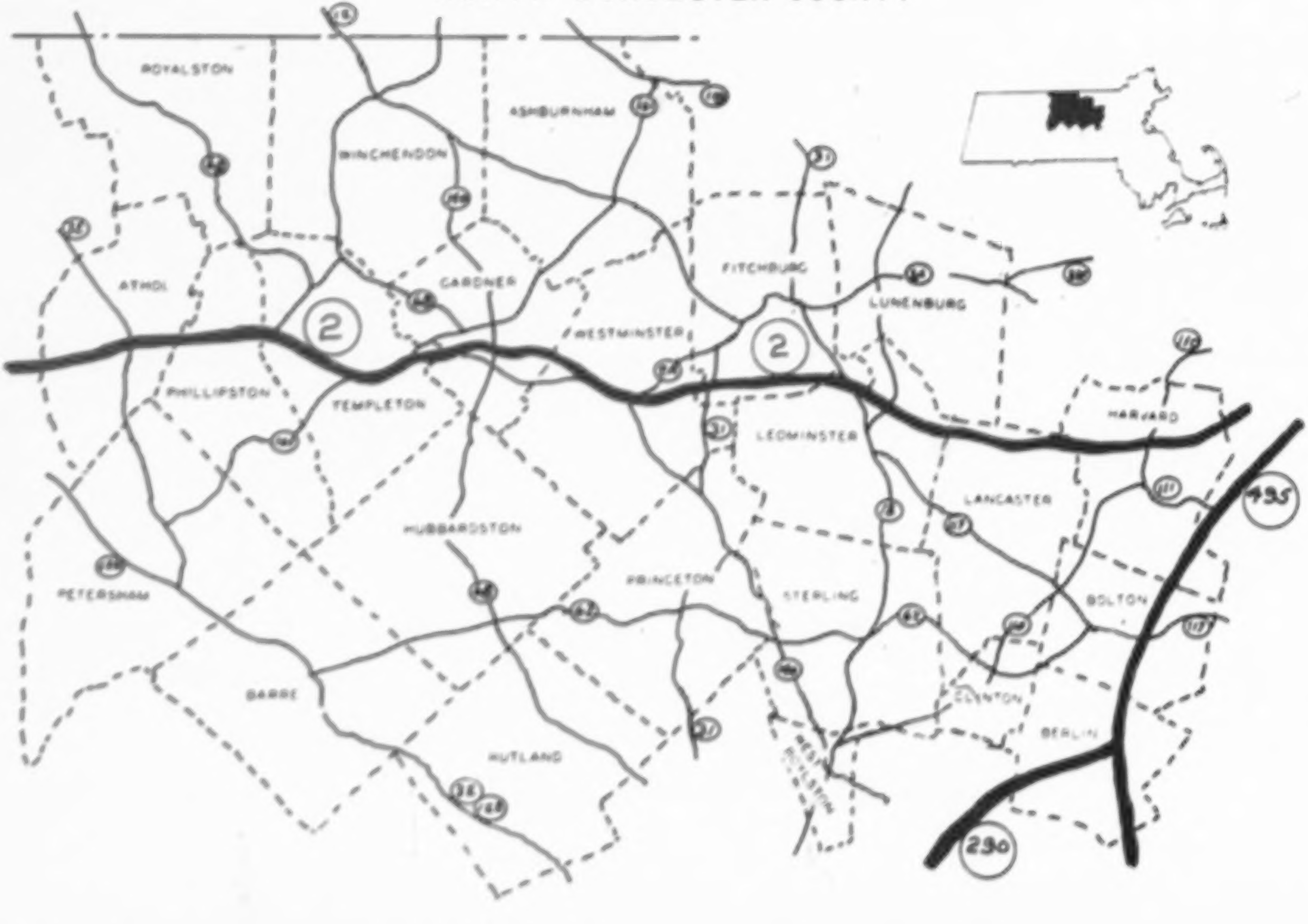
The individually owned automobile and the commercial truck dominate and will continue to dominate the transportation field in North Worcester County. Because of the high utilization of auto/truck vehicles, the overall economy of the region is sorely dependent on its road system. (SEE FIGURE 8). Highway Route 2 through the north central section and 495 in the southeast corner have contributed greatly to the commerce of the region. The need for the North-South Highway through the central section is urgent. Current predictions from the State DPW indicate it will not be completed in time to affect the projections described in this study.

The short term mobility* of the majority of North Worcester County population is associated with the rapid increase in the number of automobiles. Table IX describes the commuting problem in sample communities. Ironically, the rise in individually owned vehicles, together with the shift to truck hauling for goods has caused the volume of railroad and public bus transportation to constrict. In essence, this compounds the problem for the disadvantaged and handicapped since percentagewise, they rely more heavily on public transportation.

---

* Short term mobility describes the daily commuting movements of the population in contrast to long term mobility which describes the inflow/outflow of population due to change of residence or place of employment.

FIGURE 8
ROAD SYSTEMS
NORTH WORCESTER COUNTY


ROYALSTON
ASHBURNHAM
WINCHENDON
ATHOL
GARDNER
WESTMINSTER
FITCHBURG
LUNENBURG
HARVARD
PHILLIPSTON
TEMPLETON
LEOMINSTER
LANCASTER
HUBBARDSTON
PRINCETON
STERLING
BOLTON
PETERSHAM
BARRE
CLINTON
BERLIN
RUTLAND
WEST BOYLSTON
2
2
495
290
31
111
117

2

TABLE IX

SAMPLING - RESIDENCY VERSUS PLACE OF EMPLOYMENT

	Lives In Works In %	Lives In Works in NWC* %	Lives In Works outside NWC %	Lives In W/Armed Forces %	Works In Lives in NWC %	Works In Lives Outside NWC %
ATHOL	78(1)	5	9	5	1(5)	2
CLINTON	72	4(2)	18	1	3	2
FITCHBURG	67	12	7(3)	3	8	3(6)
LUNENBURG	13	67	15	3(4)	1	< 1

EXAMPLE:
(1) 78% of people in Athol live and work in Athol.
(2) 4% of people in Clinton live in Clinton and work in NWC.
(3) 7% of people in Fitchburg live in Fitchburg and work outside NWC.
(4) 3% of people in Lunenburg are serving in Armed Forces.
(5) 1% of people in Athol work in Athol and live in NWC
(6) 3% of people who work in Fitchburg live outside NWC.

* Northern Worcester County

< Less Than

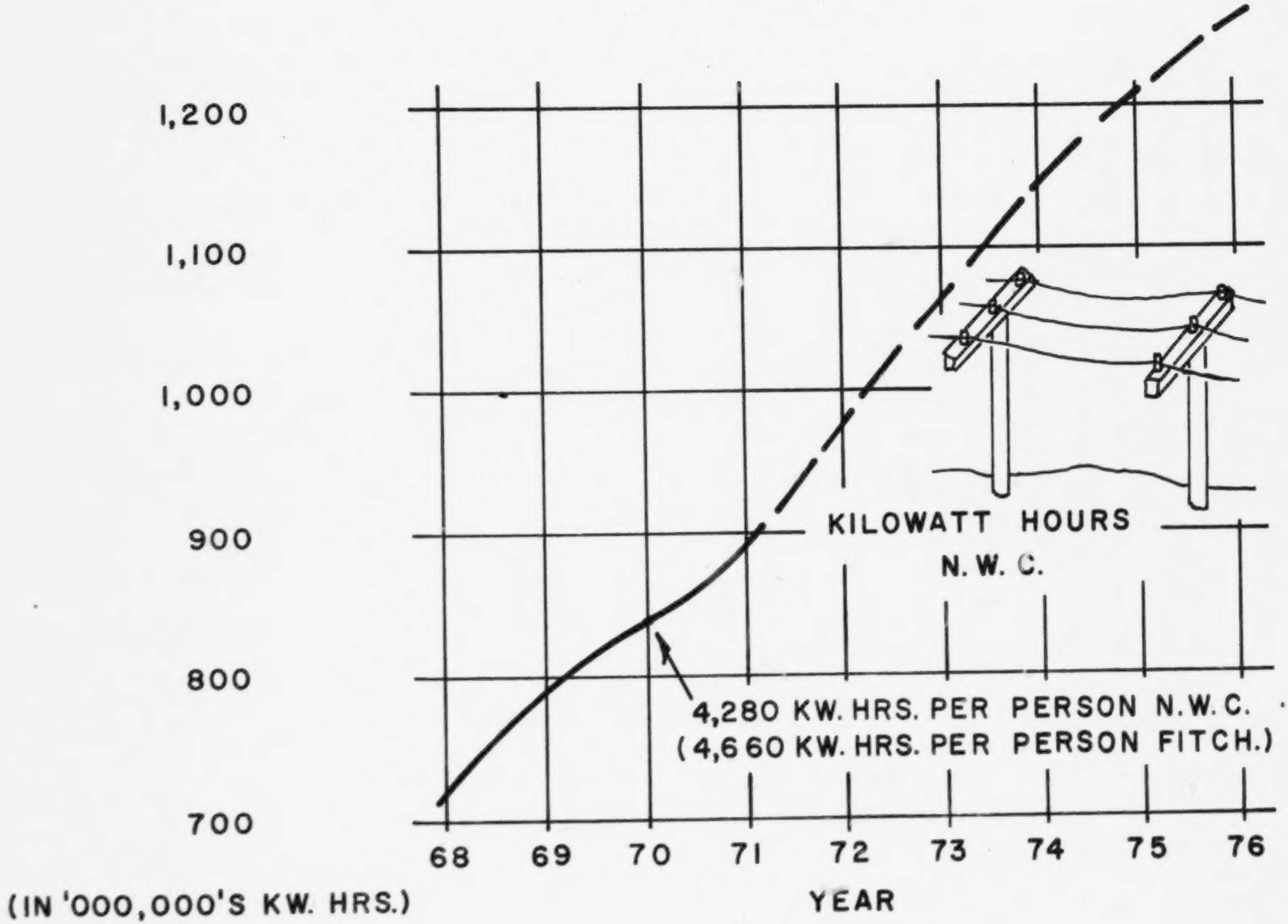
In addition to restricting the mobility of these groups for job opportunities, it also places severe limitations on their ability to reach training centers unless they are an integral part of the education and associated transportation systems. A means of transporting to the training center is imperative. The use of mobile training laboratories as part of a school system or training agency constitutes one partial solution to this problem of the disadvantaged. The mobile unit has the advantage of flexibility. An increase in the number and effectiveness of in-home training programs can also aid the handicapped.

UTILITIES:

FIGURE 9 is a plot of the projected power consumption in North Worcester County. Employment opportunities with the utilities consists of: linemen, meter readers, billing clerks, stenographic functions, telephone operators and repairmen. Employment in this field is relatively stable and can be expected to continue at a relatively uniform growth.

FIGURE 10 is a projection of the total employment requirements in the Transportation-Utility Field. These fields have been combined so as to compare with historical employment figures which have previously been compiled in this manner.

FIGURE 9



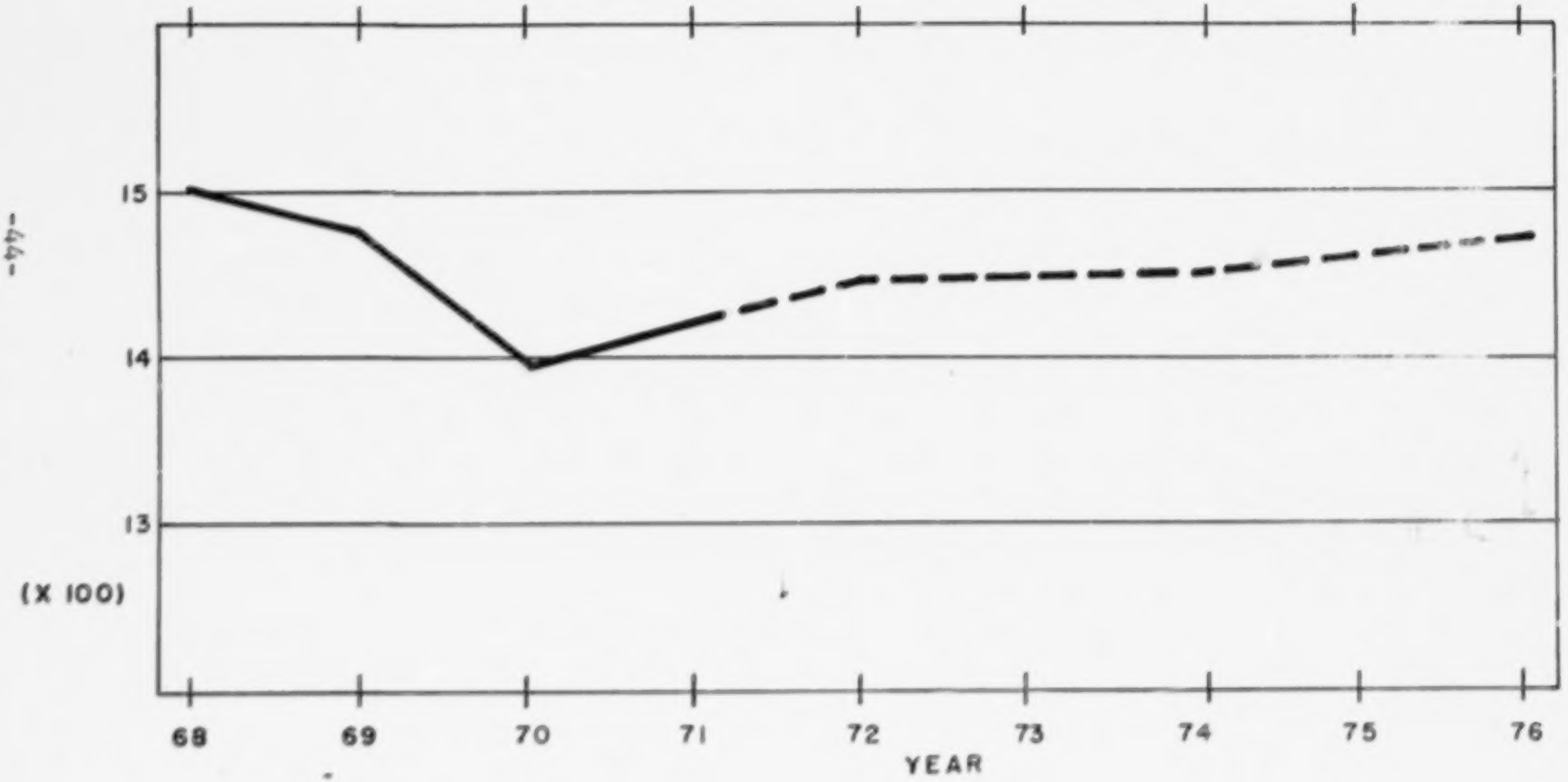
KILOWATT HOURS
N. W. C.

4,280 KW. HRS. PER PERSON N.W.C.
(4,660 KW. HRS. PER PERSON FITCH.)

FIGURE 10

NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION

TRANSPORTATION &
PUBLIC UTILITIES



TRADE (Wholesale and Retail):

The retail stores in the model draw from a larger population than the model itself, particularly on the north and northeast side. (Fort Devens personnel). This contributes some "export wealth" which is not completely negated by North Worcester County residents purchasing in Worcester or Boston. Sample surveys to test this were made by checking license plates in shopping areas and also credit card expenditures.

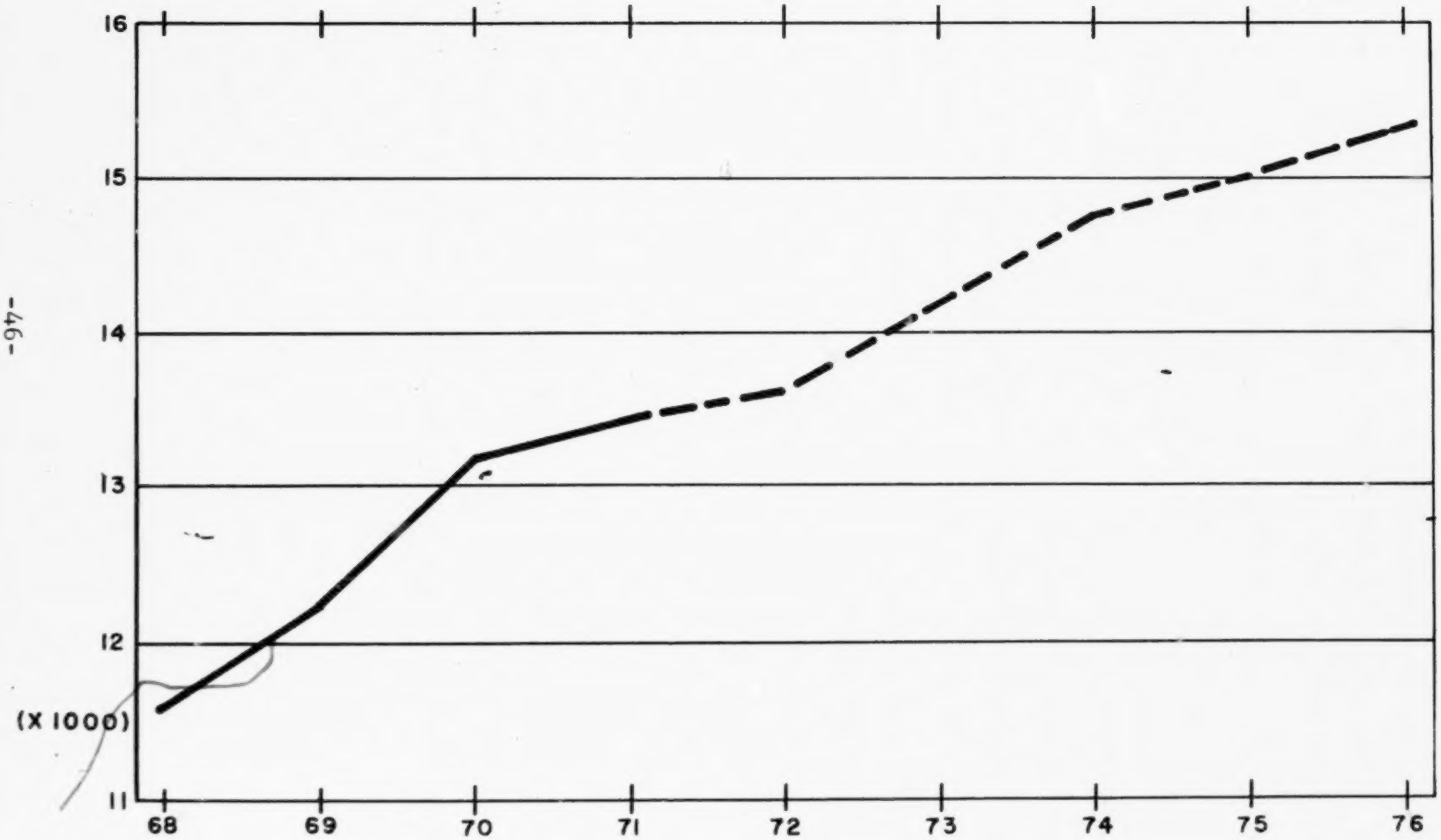
With the increase in retail of foreign manufactured goods, it appears that the economy of North Worcester County has experienced some change in the direction of: increase in "shopkeepers", decrease in "manufacturers".

FIGURE 11 is a projection of the total employment requirements in this sector.

Job opportunities include clerks, cashiers, sales personnel, accounting functions and associate distributive operations. In addition, a number of the mechanical trades appliance servicemen, auto mechanics, are included in this category where the employer is basically engaged in retail. The number of employment opportunities has grown steadily even during recent economic setbacks.

FIGURE 11
NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION

TRADE
(WHOLESALE & RETAIL)



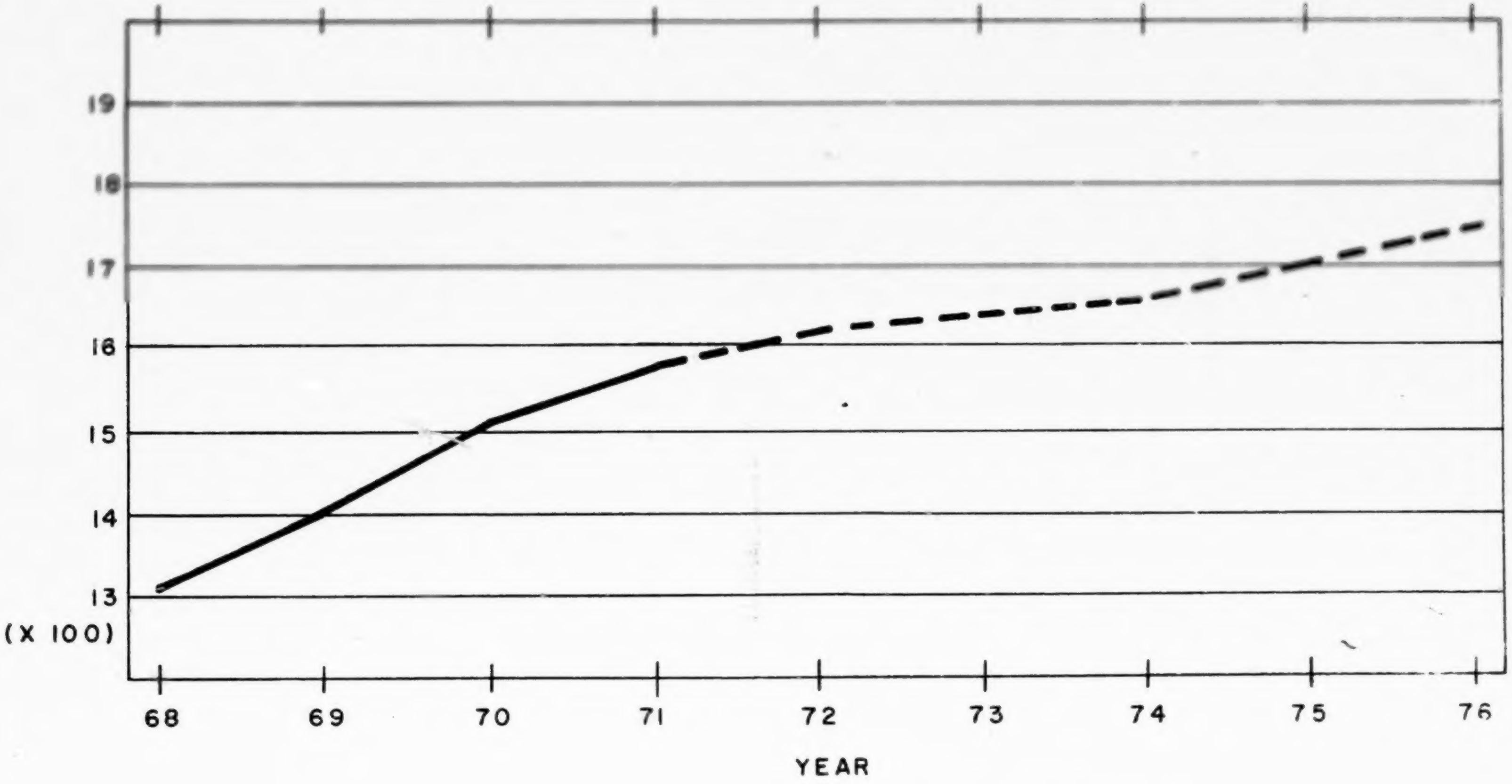
FINANCE, INSURANCE, REAL ESTATE:

This segment of the economy is interrelated with construction activity. The several factors which influence an increase or decrease in construction activity also have a bearing on the field of finance, insurance and real estate. The latter tends to be somewhat less cyclic in the quantity of activities.

Job opportunities and job entry level assignments in this segment of commerce include: Office clerks, tellers, collectors, PBX operators and telephone answering service, receptionists, and various stenographic and secretarial functions. There are many opportunities for job improvement and job progression and employment is relatively stable in this field. Some of the greatest opportunities for sales careers lie in this grouping. FIGURE 12 shows the projected employment rates for this grouping.

FIGURE 12
NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION

FINANCE, INSURANCE &
REAL ESTATE



SERVICE AND MISCELLANEOUS:

The total employment projections in this area are shown in Figure 13. These include a wide variety of health occupations, appliance servicing, gasoline station attendants, barbers, hairdressers, shoe repairmen, laundry/dry cleaning operations and the like. A wide variety of career opportunities are present herein and many are with small businesses. The opportunity for progression through a set of job experiences and the undertaking of the operation of a small business lies in this category.

Table X presents motor vehicle data together with associated job opportunities. Consultation with representatives of the department of taxation, the motor vehicle registry, automobile manufacturers, distribution and servicing agencies have supplied information which has led to the following relationship. This has also been confirmed from historical data:

$$J.O. = \frac{N\ C_s}{L}$$

Key: J.O. - Job Openings (Total)
N - Number of vehicles (Registered)
C_s - Complexity factor
L - Labor market

The job openings J.O. include not only the technical aspects of repairing and servicing but many other occupations, e.g., billing clerks, typists, parts counter man, etc.

The number of vehicles, N, has been increasing at a relatively stable rate for the past 20 years in both the state and North Worcester County.

FIGURE 13

NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION
SERVICE & MISC.
(INCL. MINING)

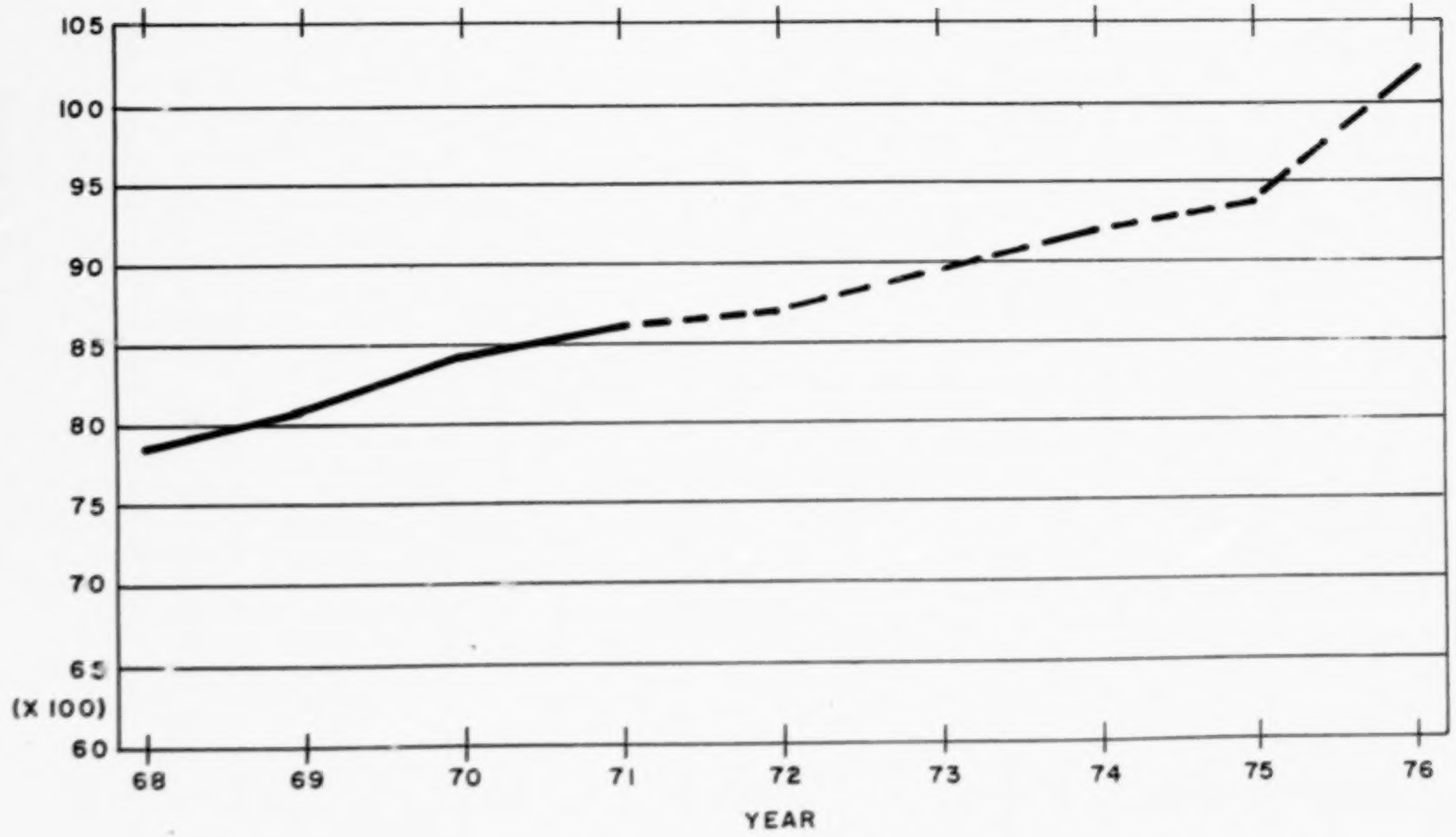
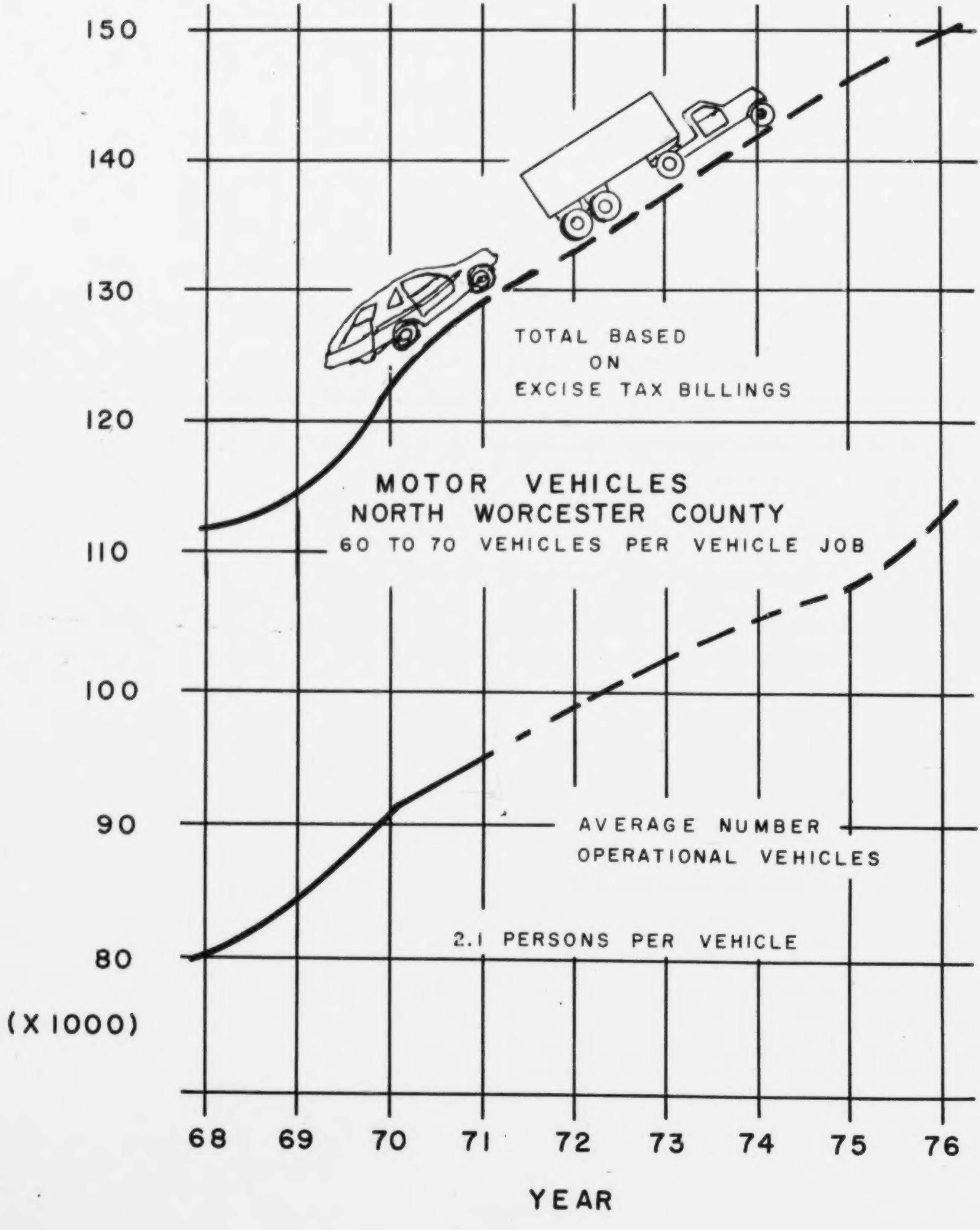


TABLE X

NORTH WORCESTER COUNTY
MOTOR VEHICLES

NORTH WORCESTER COUNTY	1960	1970	1976
Total Registrations (Vehicles)	87,294	122,661	150,666
Active Vehicles	60,232	91,257	113,000
Population	169,135	195,249*	195,500
Service Sta/Gar/Dealers	235	350	460
U. S. Persons per vehicle	2.43	1.85	1.5
N.W.C. Persons per vehicle	2.81	2.14	1.7
Mass. Persons per vehicle	3.09	2.27	1.8

* With Ft. Devens Harvard Population



150
140
130
120
110
100
90
80
(X 1000)
TOTAL BASED ON EXCISE TAX BILLINGS
MOTOR VEHICLES
NORTH WORCESTER COUNTY
60 TO 70 VEHICLES PER VEHICLE JOB
AVERAGE NUMBER OPERATIONAL VEHICLES
2.1 PERSONS PER VEHICLE
68
69
70
71
72
73
74
75
76
YEAR

The number of vehicles in North Worcester County is increasing at a somewhat faster rate. The economic conditions, percentage of population arriving and departing from driving age seems to have little effect on this study growth rate. The economic conditions do appear to affect the average age of the vehicles on the road and the types of jobs available, viz: during years of relatively low new car sales, there are more maintenance and repair job opportunities than normal. During years of high car sales, there are slightly higher incremental opportunities in car wash and polish categories. The work load in garages and body shops increases with bad winter weather and is accomodated primarily by variations in the number of hours worked.

The Complexity factor C_s is expected to affect the job openings by some +5 to +10% over the next 5 years and deals with the increased use of power steering, air conditioning, tape decks, etc.

The Labor market L, has been developed primarily from local talent. The importation or inflow has approximated those employees leaving the area, over the past decade. It is expected that this will continue for future job projections. This factor will be very close to 1.0 for North Worcester County.

The foregoing has been employed together with other data to arrive at the final job opportunity projections.

Supplementary information disclosed in the interviews: High rate of new gasoline station construction has led to a corresponding high rate of management changes and/or bankruptcy in gas stations.

This has led to a high turnover rate in gas station entry job occupations. Employee discouragement in this particular field is relatively high.

The future trend in the field of vehicle and appliance maintenance is toward the use of more sophisticated diagnostic equipment to indicate the need for adjustment or replacement of components. This emphasizes the need for training and developing the skills of critical observation of information input followed by inductive reasoning.

GOVERNMENT:

This category includes all segments of local, state and federal government employees located within the model. Job opportunities are either by direct appointment, committee selection, public election or conformance with civil service entry requirements (testing). The preponderance of employees in this category in North Worcester County are associated with local government. Redirection of national aims which resulted in the reduction or closing of Springfield Armory, Watertown Arsenal, Westover and Hanscom Air Bases, NASA, Cambridge and Defense Control Administration Service have had little direct government employee effect within the model. (These actions have adversely affected industrial activities within the model).

Fort Devens has a peripheral effect on the model by supplying a number of job opportunities to civilians in North Worcester County. Currently they employ approximately 1200 civilians. While the long term requirements of such an installation are always uncertain, it is expected that the present civilian employee demands will decrease slightly (10 to 20%) over the next five years.

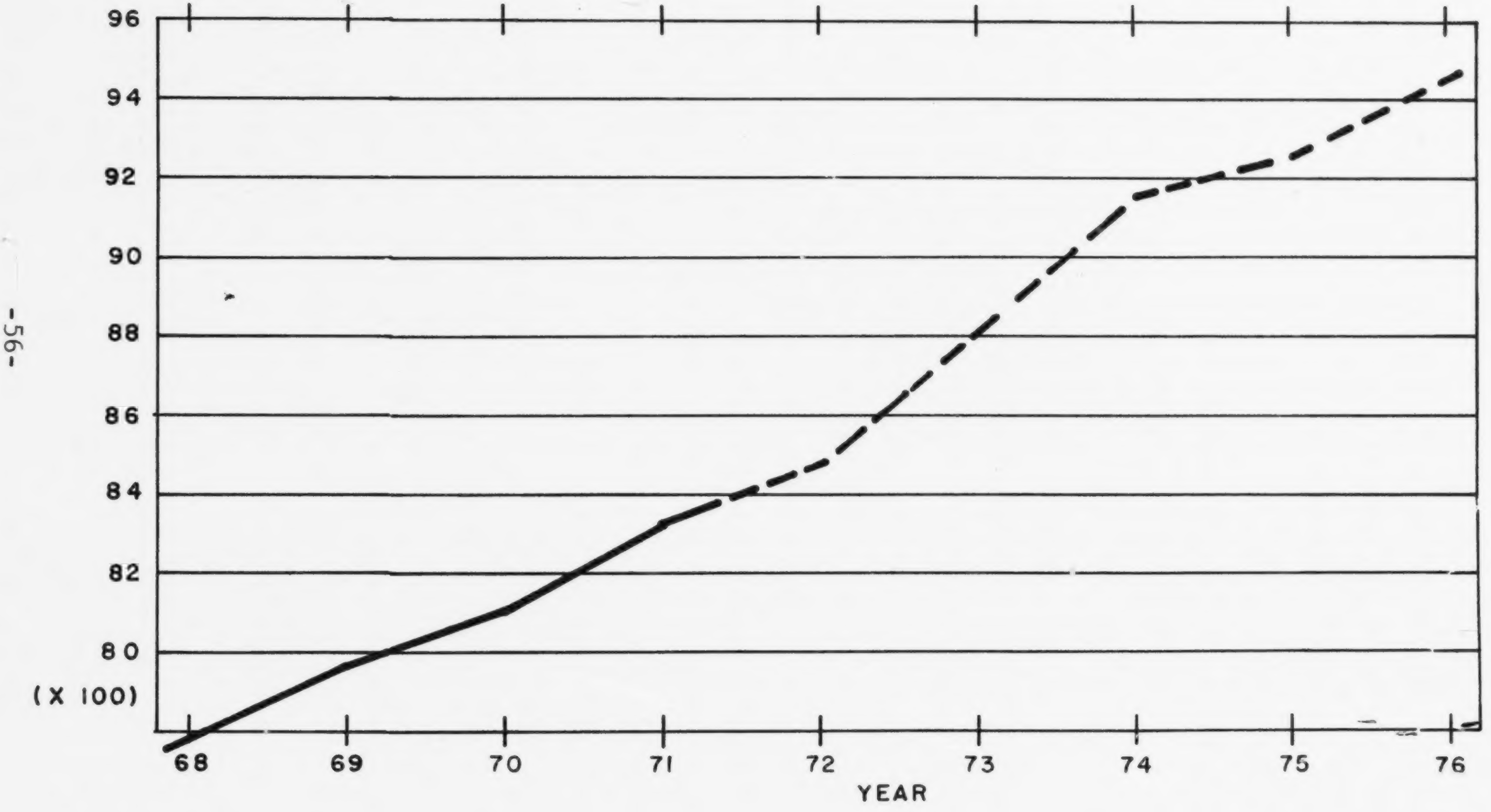
Greatest increases in job opportunities are expected to occur in the fields of public protection services, health, welfare and education. FIGURE 14 is a projection of employer requirements.

The Emergency Employment Act (EEA) is currently providing a limited number of jobs in public administration within the model. The long range effects of this cannot be predicted at this time.

FIGURE 14

NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION

GOVERNMENT



AGRICULTURAL OCCUPATIONS:

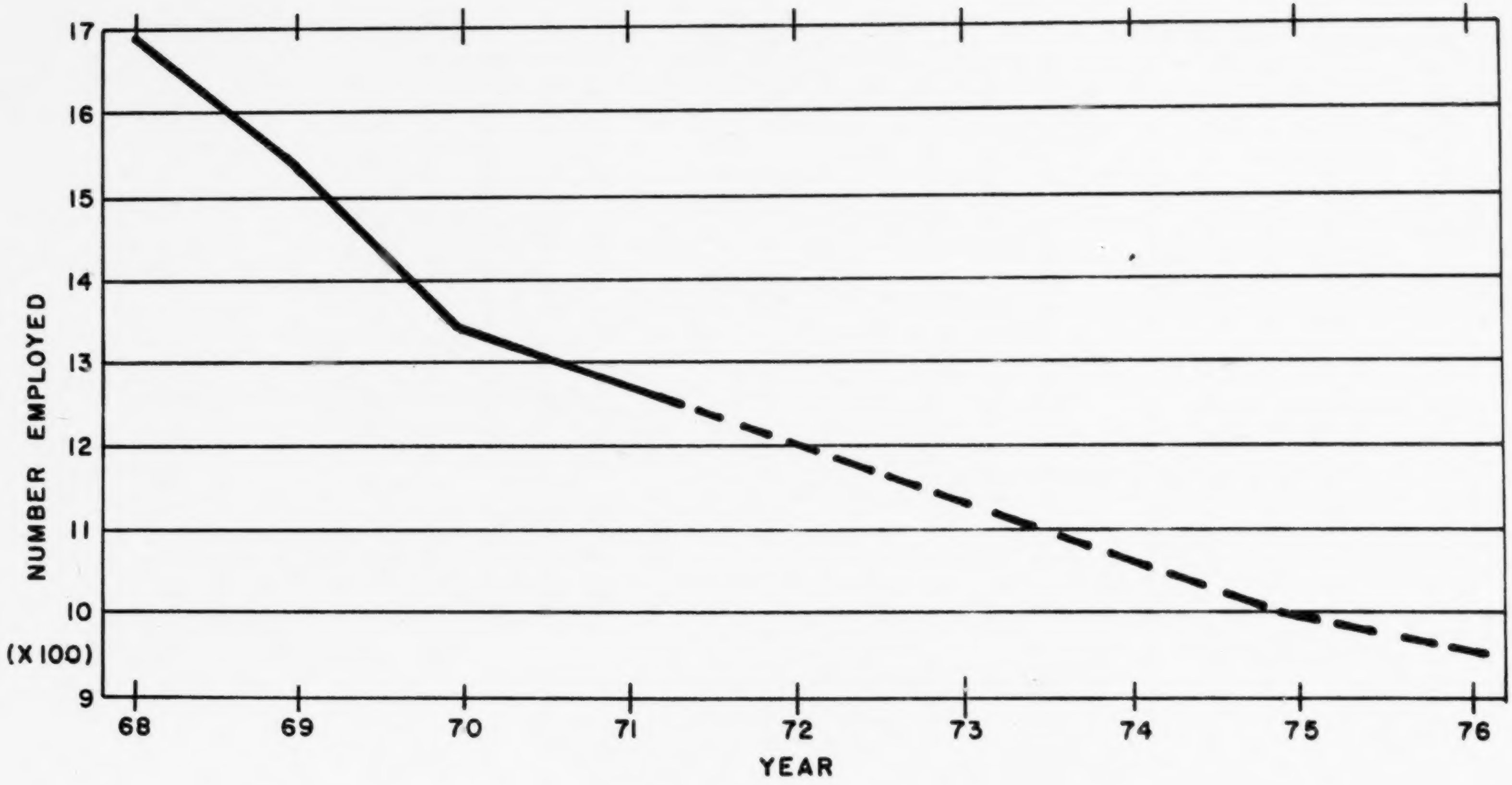
Agricultural occupations in Northern Worcester County consist essentially of those job opportunities connected with dairy, poultry, fruit and miscellaneous farming. The latter includes truck farming, landscaping/nursery and a relatively small amount of field crops and livestock. The total land area devoted to this activity in North Worcester County has continued to decline over the past two decades. This decline has been associated with the conversion of the land into residential and/or commercial usage. Housing, shopping centers, gas stations and recreational activities, e.g. bowling alleys and outdoor theaters have constituted the chief successful competitors for land. The decline in farm acreage has been accompanied by a more intensive utilization principally through mechanization and improvement in methods. As a result, the output of produce has been essentially constant for the past three decades except for year-to-year crop variations caused primarily by meteorological and associated growing conditions. Fruit growers depend on relatively few but experienced employees who work year-round, supplemented by short-term help during the harvest and packing season. The permanent employees consist primarily of personnel skilled in orchard management, spraying, trimming, and refrigeration equipment operation and few office workers for billing and record keeping. Seasonal employees are, to a large extent, Canadians, Puerto Ricans and migratory workers from the British West Indies. College students, local housewives and soldiers from Fort Devens are sometimes employed.

Preference was expressed by several employers for Canadians ("off season", Nova Scotia lobster men) who display a relatively high rate of productivity.

The total number of job opportunities associated with agriculture has been steadily declining over several decades and is expected to continue to do so. FIGURE 15 depicts the present employment together with the projection through 1976.

The area of greatest employment activity is currently in nursery stock and landscaping materials and services. This is associated with the building and construction activity taking place in the area. See Section, "CONSTRUCTION" Figure 6 and Table VIII. A definite relationship between housing starts and employment in the landscaping and nursery stock field has been noted. The chief competitive constraint on nurserymen as such, is the entry of a broad group of retailer outlets which are now aggressively merchandising "shrubbery and gardening needs". The various factors of labor cost involved in landscaping versus income of the home owner in the landscape market has resulted in an increasing number of "do-it-yourself" home landscaping activities. The grocery, department store or gas station selling shrubbery, adds to the retailing activity in the area. The source of nursery stock, the grower, becomes more of a wholesale source and it has been noted that more stock is being brought into the area from outside sources by larger specialists. This suggests a decrease in job opportunities in the local area unless countered

FIGURE 15
NORTH WORCESTER COUNTY
EMPLOYMENT PROJECTION
AGRICULTURE



by more skilled quantity growing of nursery products by local businesses.

Dairy and truck farming is, to a large extent, carried on as a family, small business. This has tended to restrict the number of job opportunities particularly for the disadvantaged. Relatively speaking, starting wages and hours have been unattractive to a large segment of workers.

Entry job opportunities in agriculture occur as seasonal or part-time employment situations. Past experience indicates that rarely is a part-time or itinerant worker able to make the transition from an entry job level to one where his skill and ability assure permanent employment. To a large extent, the temporary job is one of economic expedience and is not associated with acquiring or upgrading of skills which are necessary for a worker to achieve a progression of job levels.

Available career education has, in the past, been limited to college level. Little or nothing has been done in the regular school system, hence, skills and knowledge are limited to that acquired at home, "the farm family", on-the-job training or as incidental to some junior high and high school science courses.

APPLICATION OF LOCAL OCCUPATIONAL EMPLOYMENT MODEL

Projecting the occupational employment of North Worcester County requires the development of detailed industry-occupation matrices which summarize similar occupations e.g. auto mechanics from their respective industries.

The construction of a statistical model which will project specific occupations in a given area requires:

1. An economic model of the area and its industries.
2. An industry-occupation matrix to project occupational employment for the area.

In the two previous sections information has been developed for the local industries integrated with statistical information for the State and National levels. This combined data forms the economic basis of our model.

The industry-occupation matrix developed by Department of Labor, Bureau of Labor Statistics and published in "Tomorrow's Manpower Needs," provided the primary vehicle for projecting the occupational requirements for North Worcester County.*

THE MODEL

The purpose of the occupational model is to provide more detailed information relative to occupations which will offer employment to the occupationally disadvantaged. This information provides an insight for the planning of educational programs to coincide with future employment needs, thus, the objective of this projection is to ascertain the annual occupational employment requirements for North Worcester County.

---

* Reference: Tomorrow's Manpower Needs, Bulletin No. 1606, February 1969.

TABLE XI

TOTAL EMPLOYMENT (BY INDUSTRIES)

SIC CODE	INDUSTRY	1968	1970**	1971**	1972**	1974**	1976**
	TOTAL EMPLOYMENT	67,371*	68,824*	67,700*	70,000*	77,000*	78,600*
	Non-agriculture Total	65,673	67,478	66,830	67,673	75,926	77,643
(19-39)	MANUFACTURING	33,280	31,774	30,135	31,345	35,750	35,500
	Durable Goods	17,331	16,045	14,917	15,328	18,493	18,460
	Non-Durable Goods	15,716	15,729	15,218	15,917	17,257	17,040
	Non-manufacturing Total	32,393	35,704	36,695	37,328	40,176	42,143
(15-17)	CONSTRUCTION	2,693	3,054	3,283	3,418	3,900	4,100
(40-49)	TRANS. & PUBLIC UTILITIES	1,515	1,395	1,422	1,446	1,450	1,470
(50-59)	TRADE	11,278	13,192	13,462	13,598	14,750	15,300
(60-67)	FIN., INS., & REAL EST.	1,312	1,529	1,578	1.613	1,649	1,730
(70-89)	SERVICE & MISC.,(MINING)	7,849	8,421	8,606	8,767	9,261	10,103
(91-94)	GOVERNMENT	7,746	8,113	8,344	8,486	9,150	9,450
(01-10)	AGRICULTURE	1,698	1,346	1,271	1,199	1,060	927

*Includes wage & salary workers, self employed and unpaid family workers.

**Projected numbers.

The statistical model constructed as a result of employing the national matrix combined with data from the Department of the Census and the data compiled as a result of employer interviews projects the number of specific jobs in Northern Worcester County. This combination of national and local inputs may be utilized anywhere to obtain similar projections.

Prior to applying the occupational employment model it was necessary to establish current employment by industries for the wage and salary worker, self employed, and unpaid family worker employed in the industries in the 23 towns and cities which make up Northern Worcester County. These employment estimates were made consistent with the total employment concept. See summary of Employment by industries Table XI.

In the development of the statistical model consideration was given to the fact that occupationally disadvantaged people have to compete for employment with others within the work force. See Table XII for Population/Workforce/Employment.

The application of the model developed the total occupational employment requirements for Northern Worcester County. The total needs were determined by:

1. The number of new jobs created within a given occupation as a result of growth within a given industry.

2. The number of jobs which will become available due to separations within a given occupation resulting from death or retirement or transfer of current employees to other occupations.

TABLE XII

POPULATION/WORK FORCE/EMPLOYMENT 1968-1976

NORTH WORCESTER COUNTY

(1) YEAR	(2) POPULATION WITHOUT HARVARD FT. DEVENS	(3) WORK FORCE	(4) % POPULATION IN WORK FORCE	(5) TOTAL EMPLOYMENT	(6) UNEMPLOYMENT RATE IN %
1968	182,600	70,920	38.8*	67,370	5.0
1969	184,000	72,720	39.5*	69,300	4.7
1970	185,240	73,290	39.6*	68,820	6.1
1971**	187,000	74,400	39.8	67,800*	8.9
1972**	189,000	75,200	39.8	70,000	6.9
1974**	193,000	81,100	42.0	77,000	5.0
1976**	195,500	82,700	42.3	78,600	4.9

* Rounded

** Projected Numbers

The occupational projections are presented in Table XIII and have been summarized using related occupational groups.

Occupational Group Summary:

WHITE-COLLAR WORKERS
- Professional, technical, and kindred
- Managers, officials, and proprietors
- Clerical
- Sales

BLUE-COLLAR WORKERS
- Craftsmen and foremen
- Operatives
- Nonfarm laborers

SERVICE WORKERS

FARM WORKERS

The occupational groups are a composite of the 150 occupational titles for which our model developed employment data. For a composite of the occupational titles used in the matrix, see Appendix E.

EMPLOYMENT OF OCCUPATIONALLY DISADVANTAGED

The employer interviews and other related information indicated that the Occupationally Disadvantaged individuals are employed in the occupations of lower skills; clerical, sales, craftsmen, operative, private household workers and laborers. Thus, employment information in this study is concentrated in these occupational classifications.

TABLE XIII

EMPLOYMENT BY MAJOR OCCUPATIONAL GROUPS

1970-1976

OCCUPATIONAL GROUP	LABOR FORCE 1970	PERCENT %	PROJECTED LABOR FORCE 1976	PERCENT %
TOTAL - All Occupations	68,820*	100%	78,600*	100%
WHITE-COLLAR WORKERS				
Professional, technical & kindred	6,900	10.0	10,658	13.6
Managers, officials, & proprietors	4,350	6.3	5,409	6.9
Clerical	11,400	16.5	13,100	16.7
Sales	4,816	7.0	6,049	7.7
BLUE-COLLAR WORKERS				
Craftsmen & foremen	10,950	15.9	12,223	15.5
Operatives	20,836	30.3	19,449	24.7
Nonfarm laborers	2,266	3.3	2,200	2.8
SERVICE WORKERS	6,246	9.1	8,610	10.9
FARM WORKERS	1,069	1.6	769	1.0

* May not add due to rounding

FUTURE JOB OPPORTUNITY INFORMATION

In order to relate the information amassed on future job opportunities with educational activities, the various job categories have been grouped into occupational clusters. (Numerical data in Appendix A) These clusters are in accordance with the current U. S. Office of Education Career Clusters* as follows:

Construction
Manufacturing
Transportation
Agriculture
Business & Office
Marketing & Distribution
Communication & Media
Personal Service
Public Service
Health

---

*An organizational technique to facilitate the Delivery of Career Education, U. S. Department of Education, 1/3/72.

The major occupations listed in the clusters have been further defined in terms of employee requirements and training demands, i.e.,

WORKER TRAITS
PHYSICAL DEMANDS
WORKING CONDITIONS
GENERAL EDUCATIONAL DEVELOPMENT
SPECIFIC VOCATIONAL PREPARATION

This information is based on the Department of Labor data published in the Directory of Occupational Titles. Explanatory material on the codes used in the various columns of data is also presented in Appendix A.

By utilizing the D.O.T. numbering system and the related norms developed by the General Aptitude Test Battery it is possible to relate a given individual to an occupation or several occupations.

Within the cluster examples of "Related Jobs" have been cited. These are employment opportunities which are at different levels of achievement within the training ladder of the cluster. The cluster has all levels of job opportunities from entry level jobs through to skilled jobs, technical jobs and professional jobs. The jobs in the cluster relate to one another inasmuch as they have common skills which must be learned for a given occupational group. The skills learned within the cluster can be increased or transferred to other jobs within the cluster which requires similar learned skills.

The proposed concept of Career Clusters offers the Occupationally Disadvantaged educational/training on a continuum. This approach enables the disadvantaged individual to enter, leave and re-enter the program when it is necessary to update and acquire new skills which enable him to compete in the changing job market.

EMERGING OCCUPATIONS

A number of emerging occupations have been noted in the course of the study.

Automatic Machinery Maintenance - This requirement has grown over a number of years but has rarely been identified as such. It encompasses a need for understanding basic electronics and electrical controls, hydraulics and mechanisms. The specialists, viz., electrician or mechanic have had difficulty in trouble shooting interlocking problems. The Packaging Machinery Manufacturers Institute has been one of the first to identify this need and has offered courses as well as course material to stopgap this need.

Instrumentation maintenance involving combinations of electronic, electrical and hydraulic elements has become more necessary to hospital, industrial and educational users.

The occupations associated with computer programming, operation and maintenance continues to grow and job opportunities are increasing in the model as local employees with training are better able to compete with servicemen from Boston and Worcester.

Occupations associated with the health cluster are growing rapidly and are generally associated with expanding nursing home, hospital and dental office facilities.

JOB OPPORTUNITIES IN QUALITY CONTROL

One segment of manufacturing operations which relates to certain types of handicapped as well as to all workers is that of quality control. In recent years, an increased amount of attention has been focused on this subject.

A large segment of manufactured goods have been subjected to criticism by spokesmen for the consumer. Although in most industries, inspection tasks have always been given serious consideration, it is expected that increased emphasis will be placed on inspection in all segments of the manufacturing and service trades.

While some of these inspection jobs are integral with a particular manufacturing, fabrication, assembly or packaging operation, it has been noted that the number of job opportunities for inspectors as a separate identity is increasing. A great number of these inspection jobs have to do with visual examination of the product.

The need for additional training in visual skills exists at all levels. Vision is not only an inherited characteristic but also a learned skill. The fortunate are born with the equipment necessary to see but must learn to use this equipment more effectively. Parents and teachers coach us in walking and talking but the only skill we attain in vision is that which we pick up largely by ourselves. The single exception to this lapse in our education is that we are taught to recognize symbols and ultimately to read.

For those who can see, what are the benefits of visual training? With those of us who can run, professional training can help us to run faster, farther and with less tiring effort. The situation is precisely the same with vision. With professional training, we can see faster, more accurately, cover a larger area and be less tired at the end of the day. This holds true for bookkeepers, production workers, inspectors and all employees. When vision becomes highly trained, it results in our reading faster, learning more from our reading, making fewer mistakes, seeing more mistakes, having less accidents, getting less tired and being more productive.

To fill the increasing number of inspection jobs and to improve the seeing ability and consequently the general productivity and safety of workers, it is recommended that specific training be given in visual skills at all school levels. Based on the principles of the Renshaw system, this training would include progressive development in recognition versus exposure time to shapes, numerals, letters and familiar objects. The details of such instructional material and programming is, of course, beyond the scope of this report.

With regard to the handicapped, there are many cases where the job of visual inspection can be well filled by workers having non-visual handicaps. Experience has shown that such people do above-average work. In this area, it is conceivable that the otherwise handicapped could develop an advantage over their competitive job seekers.

CONCLUSIONS AND RECOMMENDATIONS:

Because of the multitudinous number of operational institutions, programs and systems now operating in North Worcester County, it is recommended that no additional institution or system be adopted. Present operational systems or on-going programs include the junior and senior high schools, both municipal and regional, special education programs, regional vocational schools, Mt. Wachusett Community College, Fitchburg State College, adult education programs, JOBS 70, activities of the Division of Employment Security, OEO, EEA, Mental Health Association of North Central Massachusetts, Sheltered Workshop, etc. It is recommended that an on-going program be structured to accomodate the results of this study within existing institutions, specifically:

1. That provision be made at Fitchburg State College for at least annually updating the information, both economic and educational, which has been basic to this study.

2. That a conscientious and comprehensive effort be undertaken to acquaint employers, educational leaders and teachers with the economic picture of Northern Worcester County in the next five years and the related employment opportunities.

3. That a detailed analysis and evaluation be made of present programs in occupational education in the Montachusett region in the light of the employment data and predictions made in this study and the clusters of occupations in which job opportunities will be available in Northern Worcester County.

4. That serious attention be paid to the improvement of occupational and vocational guidance provided in the schools of this area (this should be the responsibility of the Fitchburg State College).

5. That an occupational counseling program especially for the out-of-school disadvantaged and handicapped be immediately provided through an existing agency in the area; e.g., Fitchburg State College, Montachusett Opportunity Council, Division of Employment Security, etc.

6. That the basic employment problems of the handicapped and disadvantaged be dealt with by further expansion, re-orientation and intensification of the efforts of existing agencies, rather than by the creation of a new "ad hoc" structure.

7. That a combination employer, school and/or social agency supervision be provided those handicapped and disadvantaged who are placed in occupational settings for the first year of their employment. Such an arrangement would afford the necessary support, counseling and assistance necessary for such employees to become thoroughly adjusted to the requirements of their positions and aid them in becoming permanently productive members of society.

APPENDIX A

CHARTS - OCCUPATIONAL CLUSTERS

EXPLANATION OF TERMS

OCCUPAT
CON

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS **Examples of Related Jobs	EMPLOYMENT* 1970	1976	POTENTIAL TRAININ NET DEMAND	GROWTH
860.381	CARPENTERS	527	645	184	118
861.381	BRICK MASON & TILE SETTERS	134	174	58	40
844.884	CEMENT, CONCRETE FINISHERS	19	28	< 20	9
824.281	ELECTRICIANS	297	304	43	7
851.883	EXCAVATING, GRADING MACH. OPR.	120	164	56	44
840.884 841.781	PAINTERS/ PAPER HANGERS	162	213	75	51
842.781	PLASTERERS	38	66	< 40	28
862.381	PLUMBERS/PIPE FITTERS	302	409	149	107
866.381	ROOFERS/SLATERS	64	88	< 40	24
801.781	STRUCTURAL METALWORKERS	55	71	< 30	16
660.280	CABINETMAKERS	53	57	< 10	4
921.883	CRANE/DERRICK/HOIST MEN	124	131	< 20	7
865.781	GLAZIERS	30	35	< 10	5
863.884	ASBESTOS INSULATION WORKERS	11	13	< 10	2

< Less Than Ten

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATION

** Examples of related jobs are a partial listing only.

OCCUPATIONAL CLUSTER
CONSTRUCTION

T*	POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITI				
976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3	4	5
645	184	118	66	381	M	2	3	4		6	B				
174	58	40	18	381	H		3	4			B		3		
28	< 20	9	10	884	H		3	4			B		3		
304	43	7	36	281	M	2	3	4		6	B				
164	56	44	12	883	L			4			O				5
213	75	51	24	884 781	M M	2 2	3 3	4		6	I I				
66	< 40	28	< 10	781	M	2	3				B			4	
409	149	107	42	381	H	2	3	4		6	B				
88	< 40	24	< 10	381	M	2	3	4		6	O				
71	< 30	16	< 10	781	H	2	3	4		6	O				5
57	< 10	4	< 10	280	M			4		6	I				
131	< 20	7	12	883	M			4		6	B				5
35	< 10	5	< 10	781	M	2	3	4			B				
13	< 10	2	< 10	884	L	2	3	4			I				

R OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities developed w

g only.

TIONAL CLUSTER
NSTRUCTION

G DEMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
SEPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
66	381	M	2	3	4		6	B					6		4	8
18	381	H		3	4			B		3					3	8
10	884	H		3	4			B		3					3	6
36	281	M	2	3	4		6	B					6		4	7
12	883	L			4			O				5		7	3	5
24	884 781	M M	2 2	3 3	4		6	I I					6 6		2 3	4 7
<10	781	M	2	3				B			4		6		3	7
42	381	H	2	3	4		6	B					6		4	7
<10	381	M	2	3	4		6	O					6		3	7
<10	781	H	2	3	4		6	O				5	6		3	7
<10	280	M			4		6	I							4	6
12	883	M			4		6	B				5		7	3	5
<10	781	M	2	3	4			B					6		3	7
<10	884	L	2	3	4			I					6		3	3

S only. Related jobs are employment opportunities developed within the training cluster.

OCCUPATI
MANU

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAININ	
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH
809.884	ASSEMBLERS (METAL) A	523	554	138	31
706.884	ASSEMBLERS (METAL) B	1,310	1,123	21	- 187
610.381	BLACKSMITHS/FORGEMEN/HAMMERMEN	92	83	<10	- 9
500.380	ELECTROPLATERS & HELPERS	44	32	-<10	- 12
514.884	FURNACEMEN/SMELTERERS/POURERS	134	114	-<10	- 20
619.782	HEATER (METAL)	24	24	<10	0
504.782	HEAT TREATERS/ANNEALERS	109	105	<10	- 4
619.281	INSPECTORS, METALWORKERS,	663	522	15	- 141
609.684	INSPECTORS, OTHER	41	57	<30	16
685.885	KNITTERS/LOOPERS/TOPPERS	117	75	-<10	- 42
683.280	LOOM FIXER	32	38	<10	6
609.885	MACHINE TOOL OPERATORS, B	884	645	- 71	- 239
600.280	MACHINISTS & RELATED OCCUPATIONS	1,295	1,196	69	- 99
638.281	MILLWRIGHTS	72	74	14	2
518.381	MOLDERS	147	141	12	- 6
600.280	PATTERNMAKERS (METAL/WOOD)	103	97	<10	- 6
611.782	ROLLERS AND ROLL HANDS	43	36	<10	- 7
787.782	SEWERS/STITCHERS	2,052	2,620	838	268
804.281	SHEET METAL WORKERS	131	132	<20	1
682.885	SPINNERS (TEXTILE)	155	118	<10	- 37
601.280	TOOL & DIE MAKERS	449	450	61	1

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATION

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
MANUFACTURING

TENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAI
	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED
	31	107	884	M		3	4			I				5			2
	- 187	208	884	H		3	4		6	I				5	6		2
	- 9	18	381	H			4		6	I		3		5			4
	- 12	10	380	M			4			I		3				7	4
	- 20	12	884	M			4		6	I		3		5	6	7	2
	0	<10	782	H		3	4		6	I		3		5			3
	- 4	12	782	M			4		6	I		3			6	7	3
	- 141	156	684	M			4		6	I							5
	16	<10	684	M			4		6	I							2
	- 42	36	885	H			4			I				5			2
	6	<10	280	H		3	4			I				5		7	4
	- 239	168	885	M			4		6	I							2
	- 99	168	280	M			4		6	I							4
	2	12	281	H	2		4			I					6		4
	- 6	18	381	M			4		6	I						7	4
	- 6	12	280	M			4		6	I							4
	- 7	<10	782	M			4			I		3		5			3
	268	570	782	L			4		6	I							3
	1	12	281	M	2	3	4		6	B				5	6		4
	- 37	37	885	L		3	4			I				5		7	2
	1	60	280	M			4		6	I							4

CLASSIFICATIONS only. Related jobs are employment opportunities developed within the traini

CLUSTER
URING

MANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
ARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
207	884	M		3	4			I				5			2	3
208	884	H		3	4		6	I				5	6		2	5
18	381	H			4		6	I		3		5			4	7
10	380	M			4			I		3				7	4	6
12	884	M			4		6	I		3		5	6	7	2	3
10	782	H		3	4		6	I		3		5			3	5
12	782	M			4		6	I		3			6	7	3	4
56	684	M			4		6	I							5	7
10	684	M			4		6	I							2	2
36	885	H			4			I				5			2	3
10	280	H		3	4			I				5		7	4	7
68	885	M			4		6	I							2	3
68	280	M			4		6	I							4	7
12	281	H	2		4			I					6		4	7
18	381	M			4		6	I						7	4	7
12	280	M			4		6	I							4	8
10	782	M			4			I		3		5			3	4
70	782	L			4		6	I							3	5
12	281	M	2	3	4		6	B				5	6		4	7
7	885	L		3	4			I				5		7	2	3
0	280	M			4		6	I							4	7

. Related jobs are employment opportunities developed within the training cluster.

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAINING D		
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH	SE
780.884	UPHOLSTERERS	31	36	<10	5	
683.782	WEAVERS (TEXTILE)	85	68	<10	- 17	
810.884	WELDERS, FLAME CUTTERS	317	348	67	31	
	OPERATIVES & KINDRED n.e.c.	11,564	9,573	1,679	-1,991	
809.884	**Assemblers, P. Line Metal					
706.887	Assemblers, P. Line any Industry					
801.381	Assemblers, Machine Mfg.					
784.281	Milliners					
920.887	Packers					
976.782	Photo Process Workers					
690.782	Sawyers					
920.887	Wrappers					
	CRAFTSMEN KINDRED n.e.c.	565	670	195	105	
977.884	**Bookbinders					
142.081	Furrier					
771.381	Stone Cutters					

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIONS o

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
MANUFACTURING

MENT*	POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDI				
1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3	4	5
36	<10	5	<10	884	M			4		6	I				
68	<10	- 17	18	782	L		3	4		6	I				5
348	67	31	36	884	H		3	4		6	B				
9,573	1,679	-1,991	312												
				884	M		3	4			I				5
				887	M			4			I				
				381	M		3	4			I				
				281	L			4		6	I				
				887	M		3	4		6	I			4	
				782	S			4		6	I				
				782	M			4			I				5
				887	M			4		6	I				
670	195	105	90												
				884	L			4		6	I				
				081	L			4	5	6	I				
				381	M			4		6	I				5

AJOR OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities developed

ting only.

L CLUSTER
CTURING

EMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
PARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
10	884	M			4		6	I							2	3
18	782	L		3	4		6	I				5		7	3	5
36	884	H		3	4		6	B					6	7	3	6
312																
	884	M		3	4			I				5			2	3
	887	M			4			I							2	2
	381	M		3	4			I					6		4	7
	281	L			4		6	I							4	6
	887	M		3	4		6	I			4				2	2
	782	S			4		6	I							3	5
	782	M			4			I				5	6		3	5
	887	M			4		6	I						7	2	2
90																
	884	L			4		6	I							3	6
	081	L			4	5	6	I							4	8
	381	M			4		6	I				5		7	4	7

ly. Related jobs are employment opportunities developed within the training cluster.

OCCUPAT
TRAN

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAINING		
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH	
913.883	DRIVERS, BUS, TRUCK, TRACTOR	1,703	2,012	441	309	
621.281	AIRPLANE MECHANICS & REPAIRMEN	9	15	<10	5	
620.281	MOTOR VEHICLE MECHANIC	557	667	152	110	
915.878	ATTENDANT, AUTO SERVICE	285	434	167	149	

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIONS

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
TRANSPORTATION

LOYMENT*		POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CO			
	1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3	4
	2,012	441	309	132	883	L			4		6	B			
	15	<10	5	<10	281	M		3	4			B			
	667	152	110	42	281	M		3	4			B			
	434	167	149	18	878	L		3	4	5		O			

MAJOR OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities develope

sting only.

ONAL CLUSTER
PORTATION

EMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
EPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
132	883	L			4		6	B							3	3
<10	281	M		3	4			B				5			4	7
42	281	M		3	4			B							4	7
18	878	L		3	4	5		0							3	3

nly. Related jobs are employment opportunities developed within the training cluster.

OCCUPA
AGRICULTURAL-BUSI

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT *		POTENTIAL TRAININ	
	** Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH
	FARMERS & FARM WORKERS	1,069	769	-137	-300
421.884	**Farm Hand Laborer				
409.883	Farm Hand Equip. Opr.				
624.281	Farm Equip. Mechanic (Appren.)				
624.381	Farm Equip. Mechanic II				
467.384	Artificial Breeding Tech. II				
406.884	Laborer, Nursery				
411.884	Farm Hand, Dairy				
412.884	Farm Hand, Poultry				
404.884	Farm Hand, Fruit				
920.887	Packer, Agric. Products				
529.687	Sorter, Agric. Products				

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIO

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
AGRICULTURAL-BUSINESS AND NATURAL RESOURCES

PLOYMENT *		POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING		
70	1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3
69	769	-137	-300	163										
					884	M	2	3	4			O		
					883	H	2		4		6	O		
					281	M	2	3	4		6	B		
					381	M	2	3	4		6	B		
					384	L		3	4		6	I		
					884	V		3	4			B		
					884	H			4			B		
					884	M		3	4			I		
					884	M	2	3	4			O		
					887	M		3	4		6	I		
					687	L			4		6	I		

for MAJOR OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities deve

listing only.

AL CLUSTER
AND NATURAL RESOURCES

MANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
ARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
163																
	884	M	2	3	4			O							3	4
	883	H	2		4		6	O					6	7	3	5
	281	M	2	3	4		6	B				5	6		4	7
	381	M	2	3	4		6	B				5	6		3	6
	384	L		3	4		6	I					6	7	5	7
	884	V		3	4			B			4				2	3
	884	H			4			B							3	5
	884	M		3	4			I				5		7	3	3
	884	M	2	3	4			O							2	2
	887	M		3	4		6	I			4				2	2
	687	L			4		6	I			4				1	2

ly. Related jobs are employment opportunities developed within the training cluster.

OCCUPAT
BUSINE

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAININ	
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH
219.488	ACCOUNTING CLERK	92	97	<30	5
212.368	BANK TELLER	73	102	41	29
210.388	BOOKKEEPER, HAND	747	885	336	138
211.368	CASHIER	658	925	405	267
	OFFICE MACHINE OPERATOR	419	535	218	116
216.488	**Adding Machine Operator				
234.582	Addressograph Operator				
214.488	Billing Machine Operator				
215.388	Bookkeeping Machine Operator				
213.382	Digital-Computer Operator				
207.884	Duplicating Machine Operator I				
207.782	Duplicating Machine Operator II				
207.885	Duplicating Machine Operator IV				
208.782	Embossing Machine Operator				
234.885	Envelope Sealing Machine Opr.				
213.582	Key Punch Operator				
213.885	Sorting Machine Operator				
213.782	Tabulating Machine Operator				
222.387	SHIPPING/RECEIVING CLERK	634	606	38	-28
201.368	SECRETARY°	2,391°	2,720°	1,073°	329°
202.388	STENOGRAPHER°				
203.588	TYPIST°				
	CLERICAL & KINDRED n.e.c.	5,630	6,258	1,936	628
	Includes, e.g.,				
241.168	**Adjusters				
240.368	Collectors				
919.168	Dispatchers				
206.388	File Clerks				
249.368	Library Assistants				
079.378	Medical Assistants				
215.488	Payroll/Timekeeping Clerk				
237.368	Receptionist				
223.387	Stock Clerk				

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIONS

** Examples of related jobs are a partial listing only.

< Less Than Ten

° Combined to project training demands.

OCCUPATIONAL CLUSTER
BUSINESS AND OFFICE

POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS						
NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7
<30	5	24	488	S			4		6	I						
41	29	12	368	L			4	5	6	I						
336	138	198	388	S			4		6	I						
405	267	138	368	S			4	5		I						
218	116	102														
			488	S			4			I						
			582	L			4			I						
			488	S			4		6	I						
			388	S			4		6	I						
			382	L			4	5	6	I						
			884	L		3	4			I						
			782	L			4			I						
			885	L			4			I						
			782	S			4		6	I						
			885	S			4			I						
			582	S			4		6	I						
			885	L			4		6	I						
			782	L			4			I						
38	-28	66	387	M			4		6	B						
1,073°	329°	744°	368	S			4	5	6	I						
			388	S			4	5	6	I						
			588	S			4		6	I						
1,936	628	1,308														
			168	L				5		B						
			368	L						B						
			168	S				5		I						
			388	L		3	4			I						
			368	M		3	4	5		I						
			378	L			4			I						
			488	S			4	6		I						
			368	S			4	5		I						
			387	H		3	4			I						

PATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities developed within t

.

NAL CLUSTER
AND OFFICE

DEMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
EPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
24	488	S			4		6	I							4	4
12	368	L			4	5	6	I							4	5
198	388	S			4		6	I							4	6
138	368	S			4	5		I							4	5
102																
	488	S			4			I							3	3
	582	L			4			I							3	4
	488	S			4		6	I							3	4
	388	S			4		6	I							4	5
	382	L			4	5	6	I							4	6
	884	L		3	4			I							2	2
	782	L			4			I							3	4
	885	L			4			I							2	2
	782	S			4		6	I							3	4
	885	S			4			I							2	3
	582	S			4		6	I							3	4
	885	L			4		6	I							2	3
	782	L			4			I							3	5
66	387	M			4		6	B							3	5
	368	S			4	5	6	I							4	6
744°	388	S			4	5	6	I							3	5
	588	S			4		6	I							3	3
,308																
	168	L				5		B							5	8
	368	L						B							3	4
	168	S				5		I							3	5
	388	L		3	4			I							3	3
	368	M		3	4	5		I							4	4
	378	L			4			I							4	6
	488	S			4	6		I							3	4
	368	S			4	5		I							3	5
	387	H		3	4			I							3	5

nly. Related jobs are employment opportunities developed within the training cluster.

OCCU
MARKETIN

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAININ	
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH
	SALES WORKERS (Includes all clerks, Store, inside/outside sales)	4,816	6,049	2,079	1,233
290.478	**Sales Clerk				
290.468	Sales Attendant				
289.358	Salesman				
289.458	Sales Person, General				
919.883	DELIVERYMEN & ROUTEMEN	721	904	261	183

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIONS

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
MARKETING AND DISTRIBUTION

YMENT*	POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDI				
1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3	4	5
6,049	2,079	1,233	846												
				478	L			4	5		I				
				468	M			4			I				
				358	L			4	5		B				
				458	L			4	5		I				
904	261	183	78	883	L	2	3	4		6	B				5

AJOR OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities developed

ting only.

TIONAL CLUSTER
AND DISTRIBUTION

DEMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
EPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
846																
	478	L			4	5		I							3	3
	468	M			4			I							3	2
	358	L			4	5		B							3	3
	458	L			4	5		I							3	4
78	883	L	2	3	4		6	B				5	6		2	3

ly. Related jobs are employment opportunities developed within the training cluster.

OCC
COMMU

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS **Examples of Related Jobs	EMPLOYMENT*		POTENTIAL TRA	
		1970	1976	NET DEMAND	GROWTH
973.381	COMPOSITORS/TYPESETTERS	348	259	-47	-89
974.381	ELECTROTYPERS/STEREOTYPERS	24	13	<-10	-11
704.381	ENGRAVERS	28	31	<10	3
971.381	PHOTOENGRAVERS/LITHOGRAPHERS	40	55	<25	15
651.886	PRESSMAN/PLATE PRINTERS	134	137	16	4

* **POTENTIAL TRAINING DEMANDS** projected for MAJOR OCCUPATIONAL CLASSIFICAT

**** Examples of related jobs** are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
COMMUNICATIONS AND MEDIA

LOYMENT*		POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING C			
	1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2	3	4
	259	-47	-89	42	381	L			4			I			
	13	<-10	-11	<10	381	H			4		6	I			4
	31	<10	3	<10	381	M			4		6	I			
	55	<25	15	<10	381	L			4		6	I			
	137	16	4	12	886	H			4		6	I			

r MAJOR OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities develop

isting only.

ONAL CLUSTER
IONS AND MEDIA

DEMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
EPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
42	381	L			4			I							4	8
<10	381	H			4		6	I			4		6	7	3	8
<10	381	M			4		6	I							4	8
<10	381	L			4		6	I							3	6
12	886	H			4		6	I				5	6		2	2

nly. Related jobs are employment opportunities developed within the training cluster.

OCCU
PE

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAINI	
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH
526.781	BAKERS	207	172	<-10	-35
312.878	BARTENDERS	199	264	89	65
381.887	CHARWOMEN & CLEANERS	244	327	165	83
315.381	COOKS	502	669	264	167
311.878	COUNTER & FOUNTAIN WORKERS	423	570	225	147
382.884	JANITORS/SEXTONS	545	661	248	116
715.281	JEWELERS	18	21	<10	3
369.884	LAUNDRY/DRY CLEANERS	89	122	54	33
316.884	MEAT CUTTERS	155	198	67	43
633.281	OFFICE MACHINE MECHANICS	42	56	<20	14
713.381	OPTICIANS/LENS GRINDERS	44	44	<10	0
720.281	RADIO & TV MECHANICS	72	87	<30	15
311.878	WAITERS & WAITRESSES	741	966	387	225
	SERVICE WORKERS, n.e.c.	1,205	1,770	867	565
330.371	**Barbers				
785.361	Dressmaker				
332.271	Hairdresser/Cosmetologist				
341.368	Recreation Attendants				
785.381	Seamstress				
365.381	Shoemaker				
785.281	Tailors				
	OTHER MECHANICS & REPAIRMEN	2,085	2,576	755	491
637.281	**Air Conditioning				
637.281	Heating				
637.281	Refrigeration				

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIO

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
PERSONAL SERVICE

EMPLOYMENT*		POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKI	
1970	1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2
207	172	<-10	-35	30	781	H			4			I	
199	264	89	65	24	878	L			4	5		I	
244	327	165	83	82	887	H		3	4			I	
502	669	264	167	97	381	M			4		6	I	
423	570	225	147	78	878	L			4	5		I	
545	661	248	116	132	884	H		3	4			B	
18	21	<10	3	<10	281	S			4		6	I	
89	122	54	33	21	884	L			4			I	
155	198	67	43	24	884	M			4		6	I	2
42	56	<20	14	<10	281	L			4	5		I	
44	44	<10	0	<10	381	L			4		6	I	
72	87	<30	15	<10	281	M			4	5	6	I	
741	966	387	225	162	878	L			4	5		I	
1,205	1,770	867	565	302									
					371	L			4		6	I	
					361	L			4		6	I	
					271	L			4		6	I	
					368	L				5		B	
					381	L			4		6	I	
					381	L			4		6	I	
					281	L			4		6	I	
2,085	2,576	755	491	264									
					281	H	2	3	4	5	6	B	
					281	M		3	4			B	
					281	H	2	3	4	5	6	I	2

d for MAJOR OCCUPATIONAL CLASSIFICATIONS only. Related Jobs are employment opportunities dev

ial listing only.

IONAL CLUSTER
NAL SERVICE

DEMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
EPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
30	781	H			4			I							3	7
24	878	L			4	5		I							3	3
82	887	H		3	4			I							2	2
97	381	M			4		6	I			4		6		3	7
78	878	L			4	5		I							2	3
132	884	H		3	4			B							3	3
<10	281	S			4		6	I							4	8
21	884	L			4			I		3	4	5			2	3
24	884	M			4		6	I	2						3	6
<10	281	L			4	5		I							4	7
<10	381	L			4		6	I							3	6
<10	281	M			4	5	6	I							4	7
162	878	L			4	5		I							3	2
302																
	371	L			4		6	I							3	5
	361	L			4		6	I							3	6
	271	L			4		6	I							4	6
	368	L				5		B							4	3
	381	L			4		6	I							3	6
	381	L			4		6	I							3	7
	281	L			4		6	I				5			4	7
264																
	281	H	2	3	4	5	6	B				5	6	7	4	8
	281	M		3	4			B							4	8
	281	H	2	3	4	5	6	I	2			5	6	7	4	8

nly. Related Jobs are employment opportunities developed within the training cluster.

OCCUP
PU

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAINI	
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH
373.884	FIREMEN	284	369	105	85
372.868	GUARDS/WATCHMEN/DOORKEEPERS	324	337	85	13
822.381	LINEMEN/SERVICEMEN	202	285	95	83
233.388	MAIL CARRIERS	260	287	51	27
375.268	POLICE	300	417	147	117
231.388	POSTAL CLERK	224	231	31	7
235.862	TELEPHONE OPERATOR	296	426	208	130

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIO

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
PUBLIC SERVICES

EMPLOYMENT*		POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKIN	
1970	1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6	1	2
284	369	105	85	20	884	V	2	3	4	5	6	B	
324	337	85	13	72	868	L						B	
202	285	95	83	12	381	M			4		6	I	
260	287	51	27	24	388	M			4		6	B	
300	417	147	117	30	268	M			4	5	6	B	
224	231	31	7	24	388	H			4		6	I	
296	426	208	130	78	862	S			4	5	6	I	

for MAJOR OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunities deve

al listing only.

ONAL CLUSTER
C SERVICES

DEMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
EPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
20	884	V	2	3	4	5	6	B		3	4	5	6	7	3	6
72	868	L						B							3	2
12	381	M			4		6	I							4	7
24	388	M			4		6	B							3	3
30	268	M			4	5	6	B					6		3	4
24	388	H			4		6	I							3	4
78	862	S			4	5	6	I							3	3

nly. Related jobs are employment opportunities developed within the training cluster.

OCCUP

D.O.T. CODE	MAJOR OCCUPATIONAL CLASSIFICATIONS	EMPLOYMENT*		POTENTIAL TRAIN	
	**Examples of Related Jobs	1970	1976	NET DEMAND	GROWTH
	ATTENDANTS, HOSPITALS, OTHER INST.	504	789	360	285
359.878	**Child Care				
355.878	Hospital				
355.878	Occupational Therapy				
355.878	Physical Therapy				
354.878	PRACTICAL NURSES	450	725	408	275

* POTENTIAL TRAINING DEMANDS projected for MAJOR OCCUPATIONAL CLASSIFICATIO

** Examples of related jobs are a partial listing only.

< Less Than Ten

OCCUPATIONAL CLUSTER
HEALTH

ONS	EMPLOYMENT*		POTENTIAL TRAINING DEMANDS*			WORKER TRAIT GROUP#	PHYSICAL DEMANDS					
	1970	1976	NET DEMAND	GROWTH	SEPARATION		1	2	3	4	5	6
ST.	504	789	360	285	75							
						878	M			4	5	6
						878	V			4	5	
						878	L		3	4	5	
						878	L			4		
	450	725	408	275	133	878	H		3	4	5	

cted for MAJOR OCCUPATIONAL CLASSIFICATIONS only. Related jobs are employment opportunitie

artial listing only.

NAL CLUSTER
ALTH

DEMANDS*	WORKER TRAIT GROUP#	PHYSICAL DEMANDS						WORKING CONDITIONS							TRAINING TIME	
EPARATION		1	2	3	4	5	6	1	2	3	4	5	6	7	GED	SVP
75	878	M			4	5	6	I				5			3	3
	878	V			4	5		I						7	3	4
	878	L		3	4	5		I					6	7	3	4
	878	L			4			I							3	4
133	878	H		3	4	5		I						7	3	4

ly. Related jobs are employment opportunities developed within the training cluster.

PHYSICAL DEMANDS

Physical demands are those physical activities required of the worker in a job. Major classifications summarized below.

THE FACTORS:

1. Lifting, Carrying, Pushing and/or Pulling. (Strength)

The five degrees of Physical Demands Factor No. 1:

S	SEDENTARY WORK	Lifting 10 lbs. maximum
L	LIGHT WORK	Lifting 20 lbs. maximum
M	MEDIUM WORK	Lifting 50 lbs. maximum
H	HEAVY WORK	Lifting 100 lbs. maximum
V	VERY HEAVY WORK	Lifting in excess of 100 lbs.

2. Climbing and/or balancing.
3. Stooping, kneeling, crouching, and/or crawling.
4. Reaching, handling, fingering, and/or feeling.
5. Talking, and/or hearing.
6. Seeing
    1. Acuity, far-clarity of vision at 20 feet or more.
    Acuity, near-clarity of vision at 20 inches or less.
    2. Depth perception-three dimensional vision. The ability to judge distance and space relationships so as to see objects where and as they actually are.
    3. Field of vision-the area that can be seen up and down or to the right or left while the eyes are fixed on a given point.
    4. Accommodation-adjustment of the lens of the eye to bring an object into sharp focus. This item is especially important when doing near-point work at varying distances from the eye.
    5. Color vision-the ability to identify and distinguish colors.

WORKING CONDITIONS:

Working conditions are physical surroundings of a worker in a specific job.

1. Inside, Outside, or Both:

    I Inside: Protection from weather conditions but not necessarily from temperature changes.

    O Outside: No effective protection from weather.

    B Both: Inside and outside.

A job is considered "inside" when worker spends about 75% of his time inside. The job is considered "outside" when he spends about 75% of his time outside. Both is equal amounts of each.

2. Extremes of Cold plus Temperature Changes.
3. Extremes of Heat plus Temperature Changes.
4. Wet and Humid
5. Noise and Vibration
6. Hazards
7. Fumes, Odors, Toxic Conditions, Dust, and Poor Ventilation

PHYSICAL DEMANDS

Physical demands are those physical activities required of the worker in a job. Major classifications summarized below.

THE FACTORS:

1. Lifting, Carrying, Pushing and/or Pulling. (Strength)

   The five degrees of Physical Demands Factor No. 1:

S	SEDENTARY WORK	lifting 10 lbs. maximum
L	LIGHT WORK	lifting 20 lbs. maximum
M	MEDIUM WORK	lifting 50 lbs. maximum
H	HEAVY WORK	lifting 100 lbs. maximum
V	VERY HEAVY WORK	lifting in excess of 100 lbs.

2. Climbing and/or balancing.
3. Stooping, kneeling, crouching, and/or crawling.
4. Reaching, handling, fingering, and/or feeling.
5. Talking, and/or hearing.
6. Seeing
   1. Acuity, far-clarity of vision at 20 feet or more.
      Acuity, near-clarity of vision at 20 inches or less.
   2. Depth perception-three dimensional vision. The ability to judge distance and space relationships so as to see objects where and as they actually are.
   3. Field of vision-the area that can be seen up and down or to the right or left while the eyes are fixed on a given point.
   4. Accommodation-adjustment of the lens of the eye to bring an object into sharp focus. This item is especially important when doing near-point work at varying distances from the eye.
   5. Color vision-the ability to identify and distinguish colors.

WORKING CONDITIONS:

Working conditions are physical surroundings of a worker in a specific job.

1. Inside, Outside, or Both:

   I Inside: Protection from weather conditions but not necessarily from temperature changes.

   O Outside: No effective protection from weather.

   B Both: Inside and outside.

A job is considered "inside" when worker spends about 75% of his time inside. The job is considered "outside" when he spends about 75% of his time outside. Both is equal amounts of each.

2. Extremes of Cold plus Temperature Changes.
3. Extremes of Heat plus Temperature Changes.
4. Wet and Humid
5. Noise and Vibration
6. Hazards
7. Fumes, Odors, Toxic Conditions, Dust, and Poor Ventilation

		GENERAL EDUCATIONAL DEVELOPMENT
LEVEL	REASONING DEVELOPMENT	MATHEMATICAL DEVELOPMENT
6	Applying principles of logical or scientific thinking to a wide range of intellectual and practical problems. Deal with nonverbal symbolism (formulas, scientific equations, graphs, musical notes, etc.) in its most difficult phases. Deal with a variety of abstract and concrete variables. Apprehend the most abstruse classes of concepts.	Apply knowledge of advanced mathe and statistical techniques such a ferential and integral calculus, analysis, and probability determi or work with a wide variety of th mathematical concepts and make or applications of mathematical conc make original applications of mat procedures, as in empirical and d equations.
5	Apply principles of logical or scientific thinking to define problems, collect data, establish facts, and draw valid conclusions. Interpret an extensive variety of technical instructions, in books, manuals, and mathematical or diagrammatic form. Deal with several abstract and concrete variables.	Perform ordinary arithmetic, alge geometric procedures in standard, applications.
4	Apply principles of rational systems to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.	
3	Apply common sense understanding to carry out instructions furnished in written, oral, or diagrammatic form. Deal with problems involving several concrete variables in or from standardized situations.	Make arithmetic calculations inv tions, decimals and percentages.
2	Apply common sense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.	Use arithmetic to add, subtract, and divide whole numbers.
1	Apply common sense understanding to carry out simple one or two step instructions. Deal with standardized situations with occasional or no variables in or from these situations encountered on the job.	Perform simple addition and subtr reading and copying of figures or and recording.

TIONAL DEVELOPMENT

AL DEVELOPMENT	LANGUAGE DEVELOPMENT
e of advanced mathematical l techniques such as dif- integral calculus, factor probability determination, wide variety of theoretical oncepts and make original f mathematical concepts and applications of mathematical s in empirical and differential	Comprehension and expression of a level to report, write, or edit articles for such publications as newspapers, magazines, and technical or scientific journals, prepare and draw up deeds, leases, wills, mortgages and contracts. Prepare and deliver lectures on politics, economics, education, or science. Interview, counsel, or advise such people as students, clients, or patients, in such matters as welfare eligibility, vocational rehabilitation, mental hygeine, or marital relations. Evaluate engineering technical data to design buildings and bridges.
ary arithmetic, algebraic, and edures in standard, practical	Comprehension and expression of a level to transcribe dictation, make appointments for executive and handle his personal mail, interview and screen people wishing to speak to him, and write routine correspondence on own initiative. Interview job applicants to determine work best suited for their abilities and experience, and contact employers to interest them in services of agency. Interpret technical manuals as well as drawings and specifications, such as layouts, blueprints, and schematics.
ic calculations involving frac- ls and percentages.	Comprehension and expression of a level to file, post, and mail such material as forms, checks, receipts, and bills. Copy data from one record to another, fill in report forms, and type all work from rough draft or corrected copy. Interview members of household to obtain such information as age, occupation, and number of children, to be used as data for surveys, or economic studies. Guide people on tours through historical or public buildings, describing such features as size, value and points of interest.
c to add, subtract, multiply ole numbers.	
e addition and subtraction, opying of figures or counting .	Comprehension and expression of a level to learn job duties from oral instruction or demonstration. Write identifying information, such as name and address of customer, weight, number, or type of product, on tags, or slips. Request orally, or in writing such supplies as linen, soap, or work materials.

SPECIFIC VOCATIONAL PREPARATION (S.V.P.)

The amount of time required to learn the techniques, acquire information, and develop the facility needed for average performance in a specific job-worker situation. This training may be acquired in a school, work, military, institutional, or a vocational environment. Specific vocational training includes training given in any of the following circumstances:

(a) Vocational education (such as high school commercial or shop training, technical school, art school, and that part of college training which is organized around a specific vocational objective).

(b) Apprentice training (for apprenticeable jobs only)

(c) In-plant training (given by an employer in the form of organized classroom study).

(d) On-the-job training (serving as learner or trainee on the job under the instruction of a qualified worker).

(e) Essential experience in other jobs (serving in less responsible jobs which lead to the higher grade job or serving in other jobs which qualify).

The following is an explanation of the various levels of specific vocational preparation.

1. Level	2. Time
1	Short demonstration only
2	Anything beyond short demonstration up and including 30 days
3	Over 30 days up to and including 3 months
4	Over 3 months up to and including 6 months
5	Over 6 months up to and including 1 year
6	Over 1 year up to and including 2 years
7	Over 2 years up to and including 4 years
8	Over 4 years up to and including 10 years
9	Over 10 years

WORKER TRAIT PROFILE

WORKER TRAIT GROUP #	APTITUDES									INTERESTS	TEMPERAMENT
	G.V.N.			S.P.Q.			K.F.M.				
081	2 1	2 3	3	2 1	2	4 3	2 3	2 3	2 3	86	X9
168	2	3 2	3 2	4	4 3	3 2	4	4	4	29	45
268	2 3	2 2	3 3	4	4 3	4 3	4	4	4	256	4589
271	3	3	4	3 4	2 3	4	2 3	2 3	3	289	59Y
280	3	3	3 4	2	2 3	4 3	3 2	3 2	2 3	90	Y01
281	3 2	3 4	3 4	2 3	3 4	4 2	3 2	3 2	3 2	190	0Y
358	3 2	3 2	4 3	3 4	3 4	4 3	3 4	3 4	3 4	26	579
368	3	3	3 4	4	4	3	4 3	4 3	4 3	239	15
378	2 3	2 3	3	2 3	3 2	3 2	3 2	3 2	3 2	47	5Y
380	3	3	4	2	2 3	4 3	3 2	3 2	2 3	90	Y01
381	3 2	3 4	4	2 3	3 4	4 2	3 2	3 2	3 2	190	0Y
382	3	3	3	3 4	3 2	4	4 3	3	3	97	0Y
384	3	3	4 3	3 4	3 2	4	3 4	3 4	3	73	Y0
387	3	3	4	3	3 2	3 4	3 4	3 4	3 4	901Y	139
388	3 2	3	3 2	4 5	2 3	2 3	3 2	3 2	3	3	3Y
458	3 2	3 2	4 3	3 4	3 4	4 3	3 4	3 4	3 4	26	579

WORKER TRAIT PROFILE

WORKER TRAIT GROUP #	APTITUDES G.V.N.	APTITUDES S.P.Q.	APTITUDES K.F.M.	INTERESTS	TEMPERAMENT
468/478	3 3 3 4 4	4 4 4 5 3 3	4 4 4	23	523Y
488	3 3 3 2 2	4 4 2 5 3 3	3 3 3 2 2	3	3Y

582	3 3 4	3 2 2
		  3 3
			3 3 3
			  2
				93	Y2

587	4 4 4 3 5	4 4 4 3 3 3	4 4 3 3 3 4	139	2Y03
588	3 3 4 2 4 3	4 4 2 5 4 1	3 4 4 4	3	2Y
684/687	4 4 3 3 5	4 4 4 3 3 3	4 4 3 3 3 4	139	2Y03
781	3 4 4 4 3	3 3 4 2 2	3 3 3 2 2 2	190	Y091
782	3 4 4 4 3 3	3 3 4 4 4 5	3 3 3 4 4 4	91	Y0

862	3 3 4	4 3 3
		  2
			3 3 3
			    2
				23	25

868	3 3 4
	    3
		4 4 4
		    5
			4 4 4	26	58

878	3 3 4 4 4	3 3 4 3	4 4 4 3 3 3	429	589
883	3 4 4 4 5	3 4 5 4 3 4	3 4 3 4 3 4	193	23Y
884	3 4 4 4 5	4 3 5 3 4 4	3 3 3 4 4 4	9310	2Y
885	4 4 5 3 4	4 4 5 3 4	4 4 3 3 3 4	319	23Y

886	4 4 5
	    4
		4 4 5
		    4
			4 4 4
			  3 3
				31	32

887	4 4 5 4	4 4 5 5 3 4	3 4 4 4 3 3	31	23

The foregoing are cited as examples of Worker Trait Profiles.

APTITUDES

Attitudes

GVN

G INTELLIGENCE: General learning ability. Ability to reason and make judgments.

V VERBAL: To comprehend language, to understand relationships between words.

N NUMERICAL: Ability to perform arithmetic operations quickly and accurately.

SPQ

S SPATIAL: Ability to comprehend forms in space, understand relationships of plane and solid objects.

P FORM PERCEPTION: Ability to perceive pertinent detail in objects or in pictorial or graphic material.

Q CLERICAL PERCEPTION: Ability to perceive pertinent detail in verbal or tabular material.

KFM

K MOTOR COORDINATION: Ability to coordinate eyes and hands or fingers rapidly and accurately.

F FINGER DEXTERITY: Ability to move the fingers and manipulate.

M MANUAL DEXTERITY: Ability to move hands easily and skillfully.

EC

E EYE-HAND-FOOT COORDINATION: Ability to move the hand and foot coordinately with each other.

C COLOR DISCRIMINATION: Ability to perceive or recognize similarities or differences in colors.

Explanation of Level

The digits indicate how much of each aptitude the job requires for satisfactory (average) performance. The amount required is expressed in terms of equivalent amounts possessed by segments of the general working population.

The following scale is used:

1 The top 10 percent of the population. Segment has extremely high degree of the aptitude.

2 Highest third exclusive of the top 10 percent of the population. Average or high degree of the aptitude.

3 Middle third of the population. Medium degree of the aptitude. Slightly above average.

4 Lowest third exclusive of the bottom 10 percent. Below average.

5 Lowest 10 percent of the population. Negligible degree of aptitude.

INTERESTS

Preferences for certain types of work activities or experiences, with accompanying rejection of contrary types of activities or experiences.

1 vs. 6

Preference for dealing w/things and objects, vs. Concerned with people and the communication of ideas.

2 vs. 7

Preference for business contact w/people, vs. Preference for activities of scientific and technical nature.

3 vs. 8

Preference of a routine, concrete, organized nature, vs. Preference for activities of an abstract and creative nature.

4 vs. 9

Preference for working for people for their presumed good, vs. Preference for activities that are nonsocial in nature.

5 vs. 0

Preference for activities resulting in prestige, vs. Preference for activities resulting in tangible, productive satisfaction.

TEMPERAMENTS

Different types of occupational situations to which workers must adjust.

1 Situations involving variety of duties.

2 Situations involving repetitive or short cycle operations.

3 Situations involving doing things only under specific instructions.

4 Situations involving the direction, control, planning of activity.

5 Situations involving the necessity of dealing with people in job duties.

6 Situations involving working alone and apart in physical isolation.

7 Situations involving influencing people in their opinions, attitudes or judgments about ideas.

8 Situations involving performing adequately under stress.

9 Situation involving the evaluation of information against sensory or judgmental criteria.

0 Situation involving the evaluation of information against measurable or verifiable criteria.

X Situations involving the interpretation of feelings, ideas, or facts in terms of personal viewpoint.

Y Situations involving the precise attainment of set limits, tolerances.

APPENDIX B

DEFINITIONS

GLOSSARY OF TERMS

DEFINITION OF HANDICAPPED PERSONS*

"Handicapped persons" means mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled, or other health impaired persons who by reason of their handicapping condition cannot succeed in a vocational or consumer and homemaking education program designed for persons without such handicaps, and who for that reason require special educational assistance or a modified vocational or consumer and homemaking education program.

The National Association for Retarded Children which states that: 3% of the general population is retarded.

ESTIMATES OF RETARDATION OF GENERAL POPULATION BY DEGREE

RETARDED:

Profound (IQ 20) about 1½%

Severe (IQ 20-35) about 3½%

Moderate (IQ 36-52) about 6%

Mild (IQ 53+) about 89%

---

*Reference: Federal Register, Vol. 35, No. 4, Part II, January 7, 1970.

DEVELOPMENTAL CHARACTERISTICS, POTENTIAL FOR EDUCATION AND TRAINING, AND SOCIAL AND VOCATIONAL ADEQUACY AT FOUR LEVELS OF RETARDATION*

Level	Preschool age 0-5 maturation and development	School age 6-12 training and education	Adult 21 & over, social and vocational adequacy
Profound-----	Gross retardation; minimal capacity for functioning in sensorimotor areas; needs nursing care.	Obvious delays in all areas of development; shows basic emotional responses; may respond to skillful training in use of legs, hands, and jaws; needs close supervision.	May walk, need nursing care, have primitive speech; usually benefits from regular physical activity; incapable of self-maintenance.
Severe-------	Marked delay in motor development; little or no communication skill; may respond to training in elementary self-help, e.g., self-feeding.	Usually walks barring specific disability; has some understanding of speech and some response; can profit from systematic habit training.	Can conform to daily routines and repetitive activities; needs continuing direction and supervision in protective environment.
Moderate-----	Noticeable delays in motor development, especially in speech; respond to training in various self-help activities.	Can learn simple communication, elementary health and safety habits and simple manual skills; does not progress in functional reading or arithmetic.	Can perform simple tasks under sheltered conditions; participates in simple recreation; travels alone in familiar places; usually incapable of self-maintenance.
Mild---------	Often not noticed as retarded by casual observer, but is slower to walk, feed self, and talk than most children.	Can acquire practical skills and useful reading and arithmetic to a 3d to 6th grade level with special education. Can be guided toward social conformity.	Can usually achieve social and vocational skills adequate to self-maintenance; may need occasional guidance and support when under unusual social or economic stress.

*Source: Mental Retardation: A Nation Plan for a National Problem (Chart Book), p.15, August 1963. Published for the President's Panel on Mental Retardation by the U. S. Dept. H.E.W.

DISADVANTAGED

The term "disadvantaged individual" will be used in this manual as it has been defined by the Manpower Administration, U. S. Department of Labor. The definition is stated as follows:

A disadvantaged individual is a poor person who does not have suitable employment and who is either (1) a school dropout, (2) a member of a minority, (3) under 22 years of age (4) 45 years of age or over, or (5) handicapped.

The five basic combinations of the definition are:

Poor school dropout without suitable employment.

Poor minority member without suitable employment.

Poor youth without suitable employment.

Poor older worker without suitable employment.

Poor handicapped worker without suitable employment.

Clearly, any one individual might meet several of the tests at once; e.g., the poor, unemployed, Negro, handicapped, teenage dropout.

Meaning of Terms in Definition

Member of Poor Family. A person is deemed "poor" for purposes of the definition of disadvantaged if he (she) is a member of a family which (1) receives cash welfare payments, or (2) whose annual net income in relation to family size and location does not exceed the following criteria:

FAMILY SIZE	INCOME NONFARM	INCOME FARM
1	$1,600	$1,100
2	2,000	1,400
3	2,500	1,800
4	3,200	2,200
5	3,800	2,700

N.E.C. - Not elsewhere classified.

Non-Durable - Any material made or grown for immediate consumption, i.e., food and kindred products, apparel, paper.

N.W.C. - Northern Worcester County

O.C. - Occupational Cluster

O.E.O. - Office Economic Opportunities

Renshaw System - Training system for improving vision and recognition of specific objects.

Short Term Mobility - Describes the daily community movements of the population in contrast to long term mobility while describing the inflow/outflow of population due to change of residence or place of employment.

S.I.C. - Standard Industrial Classification

State D.P.W. - State Department of Public Works

Work Force - Population 16 years and over.

FAMILY SIZE	INCOME NONFARM	INCOME FARM
6	$4,200	$2,900
7	4,700	3,300
8	5,300	3,700
9	5,800	4,100
10	6,300	4,400
11	6,800	4,800
12	7,300	5,100
13 or more	7,800	5,500

Source: U. S. Department of Labor, Manpower Administration

All persons living in one household who are related to each other by blood, marriage, or adoption are regarded as one family. An individual living alone or in group quarters is considered a family.

GLOSSARY OF TERMS

B.L.S. -	Bureau of Labor Statistics
D.O.T. -	Dictionary of Occupational Titles
Durable -	Any material which has a long life expectancy, i.e., machinery, transportation equipment, furniture.
E.E.A. -	Emergency Employment Act
Entry Level Job -	Jobs available to applicants with the minimal qualifications.
Export Income -	Goods produced inside the model for sale outside the model.
General Aptitude Test Battery -	GATB - System developed by Department of Labor, Manpower Administration, Bureau of Employment Security.
Inflow/Outflow -	(in-migration-out-migration) - People moving their residence into or out of the model area.
Matrix -	A matrix is a rectangular array of elements arranged in rows and columns.
Model -	Selected geographical area employed as an example.
NASA -	National Aerospace Administration

APPENDIX C

QUESTIONNAIRE

Caution: The following clause ☐ is, ☐ is not applicable: This information not to be released* in any form by which employer is identifiable.

Full Time ________ Avg. Hrs/Wk
Part Time ________ Avg. Hrs/Wk
Seasonal ________ Avg. Wks/Yr

EMPLOYING UNIT CODE ____________________

JOB TITLE ____________________

NO. JOBS: ______ '69 ______ '70 ______ '71 ______ '72 ______ '74 ______ '76

NO JOB OPENINGS: ______ '71 ______ '72 ______ '74 ______ '76

JOB DESCRIPTION ____________________

____

____

MIN. EDUC. REQUIREMENTS (or equivalent) ____________________

WHAT SKILL OR EXPERIENCE NEEDED ____________________

____

AVERAGE LEARNING TIME ____________________

MIN. PHYSICAL REQUIREMENTS: SEE ______ HEAR ______ TALK ______ SIT ______

STAND ______ USE OF ALL LIMBS ______ FINGER DEXTERITY ______

HAND COORDINATION ______ OTHER ______

SOCIAL OR COMMUNICATION REQUIREMENTS (oral, written, vocabulary, nomenclature) ____________________

____

WHAT ON-THE-JOB TRAINING GIVEN (for this job) ____________________

____

WORKING CONDITIONS ____________________

JOB PREPARES FOR ADVANCEMENT TO ____________________

____

NORMAL WAGE RANGE (1971) ____________________

TURNOVER RATE ____________________

EXPERIENCE WITH DISADVANTAGED, HANDICAPPED, OR UNDER-EMPLOYED (this job) ____

____

*without prior written permission

(See Other Side)

FRONT

WHAT CHANGES DO YOU FORESEE IN THIS JOB CATEGORY IN THE NEXT 1 - 3 - 5 YEARS AS A RESULT OF CHANGES IN TECHNOLOGY, DEMAND, PRODUCT OR METHOD OF OPERATION?____________________

WHAT DO YOU SEE AS NEW JOBS IN THIS CATEGORY IN NEXT 1 - 3 - 5 YEARS:

BASED ON EXPANSION PLANS?____________________

BASED ON TECHNOLOGICAL CHANGE?____________________

BASED ON ESTIMATED NATURAL GROWTH?____________________

OTHER INFLUENCING FACTORS?____________________

WHAT EXPERIENCE HAVE YOU HAD WITH ON-THE-JOB TRAINING IN GENERAL?__________

WHAT EXPERIENCE HAVE YOU HAD WITH DISADVANTAGED, HANDICAPPED OR UNDER-EMPLOYED? (IN GENERAL) ____________________

INFORMATION SUPPLIED BY____________________

INTERVIEWER____________________

DATE__________

BACK

F ☐ P ☐ S ☐
①

Caution: The following clause ☐ is, ☐ is not applicable:
This information is not to be released (without prior written permission) in any form by which the employer is identifiable.

Employing Unit Code ____________ Nearest D.O.T. ____________

Job Title/Description ____________

Avg. Learning Time ____________ On Job Training Given ____________

No. Jobs: ________ '69 ________ '70 ________ '71 ________ '72 ② ________ '74 ② ________ '76 ②

No. Job Openings: ____________ '71 ____________ '72 ____________ '74 ____________ '76

Min. Ed. Requirements (or equivalent) - Min. Skills ____________

Min. Physical Requirements: Vision ____ Audio ____ Stand ____ Sit ____ Use of Limbs ____ Finger Dexterity ____ Hand Coordination ____ Other ____________

Min. Social/Communication Skills: Oral ____ Written ____ Vocabulary ____________
Nomenclature ____________
Job Prepares for Advancement to: ____________

(1) ☐F Full Time ☐P Part Time/Insert Avg.Hrs/Wk ☐S Seasonal/Insert Avg.wks/yr
(2) Anticipated - Show basis for forecast on reverse side

FRONT

Basis of Forecast Jobs 1972/74/76: ____________

Traditionally (this job): Female ☐ Male ☐ Male or Female ☐

Working Conditions ____________

Experience with Disadvantaged or Handicapped (this job category): ____________

REMARKS: ____________

Information Supplied by: ____________

Interviewer: ____________ Date: ____________

BDL Form 62371

BACK

APPENDIX D

STANDARD INDUSTRIAL CLASSIFICATIONS 1967

APPENDIX

STANDARD INDUSTRIAL CLASSIFICATION SYSTEM OF 1967

SIC CODE	INDUSTRY
A	Agriculture, forestry and fisheries
01,02,07 except 0713	Agriculture
08	Forestry
09	Fisheries
B	Mining
10	Metal Mining
11,12	Coal Mining
13	Crude petroleum and natural gas
14	Quarrying and nonmetallic mining
C(15-17)	Construction and Industry
D	Manufacturing
19,24,25, 32-39	Durable goods manufacturing
24	Lumber and wood products, excluding furniture
241	Logging camps and contractors
242-244, 249	Sawmills, millwork, and miscellaneous wood prod.
25	Furniture and fixtures
32	Stone, clay, and glass products
321-3	Glass and glass products
324, 7	Cement, concrete and plaster
325	Structural clay products
326	Pottery and related products
328, 9	Miscellaneous nonmetallic mineral and stone products
33	Primary metals industries
3312, 3	Blast furnaces and steel works
3315-7, 332, 3391, 9	Other primary metals industries
333-6, 3392	Primary nonferrous metals
34	Fabricated metal products

APPENDIX

STANDARD INDUSTRIAL CLASSIFICATION SYSTEM OF 1967

SIC CODE	INDUSTRY
35	Machinery, except electrical
352	Farm machinery and equipment
357	Office machinery
351, 3-6, 8, 9	Miscellaneous machinery
36	Electrical machinery, equipment, and supplies
37	Transportation equipment
371	Motor vehicle and equipment
372	Aircraft and parts
373	Ship and boat building
374, 5, 9	Railroad and other transportation equipment
38	Instruments and allied products
381-6, 194	Instruments and fire control equipment
387	Watches and clock devices
39	Miscellaneous manufacturing
20-23, 26-31	Nondurable goods manufacturing
20	Food and kindred products
201	Meat products
202	Dairy products
203	Canning, preserving and freezing
204	Grain mill products
205	Bakery products
208	Beverage industries
206, 7,9	Other food products
21	Tobacco manufacturers
22	Textile mill products
23	Apparel and related products
26	Paper and allied products
261-3, 6	Pulp, paper and paperboard mills
265	Paperboard containers and boxes
264	All other paper products
27	Printing, publishing, and allied products
28	Chemicals and allied products
2823,4	Synthetic fibers
283	Drugs and medicine
285	Paints, varnishes, and related products

APPENDIX

STANDARD INDUSTRIAL CLASSIFICATION SYSTEM OF 1967

SIC CODE	INDUSTRY
281,2821, 2, 284, 6, 7, 9	Other chemicals
29	Petroleum refining and related industries
291	Petroleum refining
295, 9	Other petroleum and coal products
30	Rubber and miscellaneous plastic products
301-3, 6	Rubber products
307	Miscellaneous plastic products
31	Leather and leather products
311	Leather tanning and finishing
313, 4	Footwear, except rubber
312, 5-7, 9	All other leather products
E (40-49)	Transportation, communication and public utilities
40-47	Transportation
40	Railroad transportation
41	Local and suburban transit and interurban passenger transportation
411, 3-5, 7	Local and interurban, except taxis
412	Taxis
42	Motor freight transportation and storage
421, 3	Trucking
422	Warehousing
44	Water transportation
45	Transportation by air
46	Pipelines
47	Transportation services
48-49	Communication and public utilities
48	Communication
481	Telephone
482, 9	Telegraph
483	Radio and television

APPENDIX

STANDARD INDUSTRIAL CLASSIFICATION SYSTEM OF 1967

SIC CODE	INDUSTRY
49	Electric, gas and sanitary services
491-3,6	Electric, gas and steam
494, 7	Water and irrigation
495	Sanitary services
F (50-59)	Wholesale and retail trade
50	Wholesale trade
501	Motor vehicles and equipment
502	Drugs and chemicals
503	Dry goods and apparel
504	Groceries and related
506, 7	Electrical goods, plumbing and heating supplies
508	Machinery and equipment
505, 9	Farm produce and miscellaneous
52-59	Retail Trade
52	Building materials, hardware and farm equipment
53	General merchandising
533	Limited price stores
53 except 533	Other general merchandise
54	Food and Drug
55	Automobile dealers and gas stations
55 except 554	Automobile dealers
554	Gas stations
56	Apparel and accessories
57	Furniture, etc.
58	Eating and drinking places
59	Miscellaneous retail stores
591	Drug stores
59 except 591	Other retail stores

m

APPENDIX

STANDARD INDUSTRIAL CLASSIFICATION SYSTEM OF 1967

SIC CODE	INDUSTRY
G (60-67)	Finance, insurance and real estate
60,61,62,67	Finance
60, 61	Banks and credit agencies
62, 67	Stock brokers and investment companies
63, 64	Insurance
65, 66	Real Estate
H (70,72,73, 75,76,78-82, 84,86,88, 89)	Services
88	Private household
H (70,72,73, 75,76,78-82, 84,86,89)	Services, except private household
70	Hotels and other lodging places
72	Personal services
721, 7	Laundry, cleaning, and valet services
722-6, 9	All other personal services
73	Miscellaneous business services
731	Advertising
732-6, 9	Other miscellaneous business services
75	Automobile repair services and garages
	Miscellaneous repair services
78, 79	Entertainment and recreation
78, 792	Motion pictures and theatres
793, 1, 4	Miscellaneous entertainment and recreation
80	Medical and other health services
806	Hospitals
80 except 806	Other medical and health services
81	Legal services
82, 84	Educational services

APPENDIX

STANDARD INDUSTRIAL CLASSIFICATION SYSTEM OF 1967

SIC CODE	INDUSTRY
86	Nonprofit membership organizations
866, 7	Welfare and religious
861-5, 9	Other nonprofit
89	Miscellaneous services
891	Engineering and architectural
893	Accounting and bookkeeping
892, 9	All other professional services
I (91-94)	Public administration (1)
91	Postal services
94	Other federal public administration
92	State government
93	Local government

(1) Includes public administration employment only. Government agencies engaged in educational and medical services and in activities commonly carried on also by private enterprises, such as transportation and manufacturing, are classified in the appropriate industrial category.

APPENDIX E

OCCUPATIONAL TITLES IN THE MATRIX

OCCUPATIONAL TITLES IN MATRIX

PROFESSIONAL, TECHNICAL, KINDRED

ENGINEERS, TECHNICAL

- ENGINEERS, AERONAUTICAL
- ENGINEERS, CHEMICAL
- ENGINEERS, CIVIL
- ENGINEERS, ELECTRICAL
- ENGINEERS, INDUSTRIAL
- ENGINEERS, MECHANICAL
- ENGINEERS, METALLURGICAL, ETC.
- ENGINEERS, MINING
- OTHER ENGINEERS, TECHNICAL

NATURAL SCIENTISTS

- CHEMISTS
- AGRICULTURAL SCIENTISTS
- BIOLOGICAL SCIENTISTS
- GEOLOGISTS, GEOPHYSICSTS
- MATHEMATICIANS
- PHYSICISTS
- OTHER NATURAL SCIENTISTS

TECHNICIANS, EXC. MEDICAL, DENTAL

- DRAFTSMEN
- SURVEYORS
- AIR TRAFFIC CONTROLLERS
- RADIO OPERATORS
- TECHNICIANS, OTHER

MEDICAL, OTHER HEALTH WORKERS

- DENTISTS
- DIETITIANS, NUTRITIONISTS
- NURSES, PROFESSIONAL
- OPTOMETRISTS
- OSTEOPATHS
- PHARMACISTS
- PHYSICIANS AND SURGEONS
- PSYCHOLOGISTS
- TECHNICIANS, MEDICAL, DENTAL
- VETERINARIANS
- OTHER MEDICAL, HEALTH WORKERS

OCCUPATIONAL TITLES IN MATRIX

TEACHERS

TEACHERS, ELEMENTARY
TEACHERS, SECONDARY
TEACHERS, COLLEGE
TEACHERS, OTHER

SOCIAL SCIENTISTS

ECONOMISTS
STATISTICIANS AND ACTUARIES
OTHER SOCIAL SCIENTISTS

OTHER PROF., TECH., AND KINDRED

ACCOUNTANTS AND AUDITORS
AIRPLANE PILOTS, NAVIGATORS
ARCHITECTS
WORKERS IN ARTS, ENTERTAINMENT
CLERGYMEN
DESIGNERS, EXC. DESIGN DRAFT
EDITORS AND REPORTERS
LAWYERS AND JUDGES
LIBRARIANS
PERSONNEL AND LABOR REL. WORKS
PHOTOGRAPHERS
SOCIAL AND WELFARE WORKERS
PROF., TECH., KINDRED, NEC

MANAGERS, OFFICIALS, PROPRIETORS

CONDUCTORS, RAILROAD
CREDITMEN
OFFICERS, PILOTS, ENGRS., SHIP
POSTMASTERS AND ASSISTANTS
PURCHASING AGENTS
MANAGERS, OFFICE, PROP. NEC

CLERICAL AND KINDRED WORKERS

STENOS, TYPISTS, SECRETARIES

OFFICE MACHINE OPERATORS

OCCUPATIONAL TITLES IN MATRIX

OTHER CLERICAL, KINDRED WORKERS

ACCOUNTING CLERKS
BOOKKEEPERS, HAND
BANK TELLERS
CASHIERS
MAIL CARRIERS
POSTAL CLERKS
SHIPPING, RECEIVING CLERKS
TELEPHONE OPERATORS
CLERICAL AND KINDRED, NEC

SALES WORKERS

CRAFTSMEN, FOREMEN AND KINDRED

CONSTRUCTION CRAFTSMEN

CARPENTERS
BRICKMASONS AND TILE SETTERS
CEMENT, CONCRETE FINISHERS
ELECTRICIANS
EXCAVATING, GRADING MACH. OPER.
PAINTERS AND PAPERHANGERS
PLASTERERS
PLUMBERS AND PIPE FITTERS
ROOFERS AND SLATERS
STRUCTURAL METALWORKERS

FOREMEN, NEC

METALWORKING CRAFTS, EXC. MECH.

MACHINISTS AND RELATED OCC.
BLACKSMITHS, FORGEMEN, HAMMERMEN
BOILERMAKERS
HEAT TREATERS, ANNEALERS
MILLWRIGHTS
MOLDERS, METAL, EXC. COREMAKERS
PATTERNMAKERS, METAL, WOOD
ROLLERS AND ROLL HANDS
SHEET METAL WORKERS
TOOLMAKERS AND DIEMAKERS

OCCUPATIONAL TITLES IN MATRIX

PRINTING TRADES CRAFTSMEN

- COMPOSITORS, TYPESETTERS
- ELECTROTYPERS, STEREOTYPERS
- ENGRAVERS, EXC. PHOTOENGRAVERS
- PHOTOENGRAVERS, LITHOGRAPHERS
- PRESSMEN, PLATE PRINTERS

TRANSPORT, AND PUB. UTIL. CRAFT

- LINEMEN AND SERVICEMEN
- LOCOMOTIVE ENGINEERS
- LOCOMOTIVE FIREMEN

MECHANICS AND REPAIRMEN

- AIRPLANE MECH. AND REPAIRMEN
- MOTOR VEHICLE MECHANICS
- OFFICE MACHINE MECHANICS
- RADIO AND TV MECHANICS
- R.R. AND CAR SHOP MECHANICS
- OTHER MECHANICS AND REPAIRMEN

OTHER CRAFTSMEN AND KINDRED

- BAKERS
- CABINETMAKERS
- CRANE, DERRICK, HOIST MEN
- GLAZIERS
- JEWELERS AND WATCHMAKERS
- LOOM FIXERS
- OPTICIANS, LENS GRINDERS
- INSPECTORS, LOG AND LUMBER
- INSPECTORS, OTHER
- UPHOLSTERERS
- CRAFTSMEN AND KINDRED, NEC

OPERATIVES AND KINDRED WORKERS

DRIVERS AND DELIVERYMEN

- DRIVERS, BUS, TRUCK, TRACTOR
- DELIVERYMEN AND ROUTEMEN

OCCUPATIONAL TITLES IN MATRIX

TRANSPORTATION AND PUB. UTIL. OPS.

- BRAKEMEN AND SWITCHMEN R.R.
- POWER STATION OPERATORS
- SAILORS AND DECKHANDS

SEMISKILLED METALWORKING OCC.

- FURNACEMEN, SMELTERMEN, POURERS
- HEATERS, METAL
- WELDERS AND FLAME CUTTERS
- ASSEMBLERS, METALWRK., CLASS A
- ASSEMBLERS, METALWRK., CLASS B
- INSPECTORS, METALWRK., CLASS B
- MACHINE TOOL OPERATOR, CLASS B
- ELECTROPLATERS
- ELECTROPLATERS HELPERS

SEMISKILLED TEXTILE OCCUPATIONS

- KNITTERS, LOOPERS, TOPPERS
- SPINNERS, TEXTILE
- WEAVERS, TEXTILE
- SEWERS AND STITCHERS, MFG.

OTHER OPERATIVES AND KINDRED

- ASBESTOS, INSULATION WORKERS
- ATTEND, AUTO SERVICE, PARKING
- BLASTERS AND POWDERMEN
- LAUNDRY, DRY CLEANING OPERATOR
- MEAT CUTTERS, EXC. MEAT PACKING
- MINE OPERATIVES, LABORERS, NEC
- OPERATIVES AND KINDRED, NEC

SERVICE WORKERS

PRIVATE HOUSEHOLD WORKERS

PROTECTIVE SERVICE WORKERS

- FIREMEN
- GUARDS, WATCHMEN, DOORKEEPERS
- POLICE, OTHER LAW ENFORCE. OFF.

OCCUPATIONAL TITLES IN MATRIX

FOOD SERVICE WORKERS

- BARTENDERS
- COOKS, EXC. PRIVATE HOUSEHOLDS
- COUNTER AND FOUNTAIN WORKERS
- WAITERS AND WAITRESSES

OTHER SERVICE WORKERS

- AIRLINE STEWARDS, STEWARDESSES
- ATTENDANTS, HOSPITALS, OTHER INSTITUTIONS
- CHARWOMEN AND CLEANERS
- JANITORS AND SEXTONS
- NURSES, PRACTICAL
- SERVICE WORKERS, NEC

LABORERS, EXC. FARM AND MINE

FARMERS AND FARM WORKERS

APPENDIX F

ACKNOWLEDGEMENTS CONTINUED

ACKNOWLEDGEMENTS

Associated Industries of Massachusetts

Association of Home Appliances

Automotive Service Industrial Association

Banking Institutions of Worcester County

Educational Institutions - University of
    Massachusetts - Fitchburg State College -
    Montachusett Regional Vocational School

Farm Bureau

Federal Reserve Bank

Fitchburg Chamber of Commerce

Gardner/Athol Mental Health Association

Hospitals - Burbank Hospital
    Leominster Hospital
    Rutland Rehabilitation Center

Insurance - Brokers of Worcester County

Massachusetts -
- Department of Agriculture
- Department of Commerce
  - Bureau of Statistics
  - Science and Technology Department
  - Bureau of Commercial and Industrial Development
  - Department of Insurance
  - Department of Labor

ACKNOWLEDGEMENTS

Division of Employment Security
Census Bureau
Division of Statistics
Occupational Research Department
Office of State Librarian
Office of Representative Bourque
Office of Representative Dolan
Office of Planning & Program Coordination
Registry of Motor Vehicles
Massachusetts Association of Nursing Homes
Montachusett Planning Commission
Municipal & Town Government
Department of Buildings
Department of Taxes
Department of Welfare
State Department of Mental Health
Rehabilitation Commission
Bureau of Developmental Disability
Mental Health Area Board - Worcester
Oil Institute of Massachusetts
Retarded Children NAC Workshop
Real Estate Brokers of Worcester County
Restaurant Association

ACKNOWLEDGEMENTS

United States -

NASA

Office of Congressman Drinan

President's Committee for Handicapped

Department of Agriculture

Department of Commerce

Bureau of Census

Office of Economic Opportunity

Department HEW

Department of Labor

Bureau of Labor Statistics

Others who contributed as special project consultants were:

Robert N. Foster - Real Estate
Ralph S. Foster Co., Inc.

Walter S. Frank - Economist
Walden Associates

William S. Reagan - Certified Public Accountant

Donald Sutherland - Personnel Consultant

BIBLIOGRAPHY AND DATA SOURCES

Administration of Vocational Education - Rules and Regulations, U. S. Department of Health, Education, and Welfare, Vocational Education Bulletin No. 1, Revised 1966.

Before the decade ends..., Associated Industries of Massachusetts, Boston, Massachusetts

Career Education, U.S. Department of Health, Education, and Welfare, DHEW Publication No. (OE) 72-39, 1971.

Commonwealth of Massachusetts Annual Manpower Planning Report, Division of Employment Security, December 1970.

County Business Patterns, Massachusetts, U. S. Department of Commerce, Bureau of the Census, CBP-69-23, 1968-1971.

Directory of New England Manufacturers, The New England Council, Thirty-Sixth Annual Edition, 1972.

Directory of Programs and Services, Division of Employment Security, May 1967.

Dictionary of Occupational Titles, U.S. Government Printing Office, Washington, D.C., U.S. Department of Labor, 1965.

Economic Impact of a Military Base, A Case Study of Fort Devens, Massachusetts, Donald Terner, New England Business Review, 1965.

Employment and Earnings Statistics for the United States, Bureau of Labor Statistics, Bulletin No. 1312-7, 1970.

Employment Opportunities for the Handicapped, Juvenal L. Angel, Modern Vocational Trends Bureau, 1969.

Employment and Wages and Contribution Reports, Massachusetts Division of Employment Security, E.S. 202, Quarterly 1960-1969.

Guide to Jobs for the Mentally Retarded, American Institute for Research, Pittsburgh, Pennsylvania, February 1964.

Handbook of Labor Statistics, U. S. Department of Labor, Bureau of Labor Statistics, Bulletin 1536, 1971.

Massachusetts Department of Agriculture Directory of Agricultural Organizations and Home Economics Leaders, Charles H. Callahan, 1971.

BIBLIOGRAPHY AND DATA SOURCES

Massachusetts Census of Housing, U. S. Dept. of Commerce, Bureau of the Census, Publication #5556, February 1971.

Massachusetts Census of Population, U. S. Dept. of Commerce, Bureau of the Census, Publication #5557, February 1971.

Massachusetts Commerce Digest, Massachusetts Department of Commerce and Development.

Massachusetts Department of Education Membership, Staff, Financial Profiles, Division of Special Education, July 1, 1970 - June 30, 1971.

Massachusetts Department of Labor and Industries Employment Newsletters, Department of Labor, Division of Statistics.

Massachusetts Department of Mental Health Annual Statistical Summary For Inpatient Facilities, Massachusetts Dept. of Mental Health, Publication No. 5741, June 1971.

Massachusetts Industrial Directory 1971, Associated Industries of Massachusetts, 1971.

Massachusetts Manpower Requirements To 1975, Division of Employment Security, Occupational Research Department, October 1971.

Massachusetts Municipalities Ranked By Size 1970, Bureau of Research and Statistics, Mass. Dept. of Commerce & Development, February 1971.

Massachusetts Trends in Employment and Unemployment, Division of Employment Security, 1968-1971.

National Association For Mental Health Manual Mental Health Seminars For Business and Industrial Executives, 1963.

New England Weekly Weather and Crop Bulletins, U. S., New England State Departments of Agriculture, Monthly, 1968-1971.

New Home Building in Massachusetts, Massachusetts Department of Commerce and Development, Publication #21, December 1971.

Number of Inhabitants Massachusetts, U. S. Department of Commerce, Bureau of the Census, PC(1)-A23, Mass., June 1971.

Occupational Educational Programs for the Handicapped, Commonwealth of Massachusetts Department of Occupational Education, Bureau of Special Needs, Region VII Conference, October 1971.

BIBLIOGRAPHY AND DATA SOURCES

Occupational Employment Patterns For 1960 and 1975, Manpower Administration, U.S. Dept. of Labor, Bulletin No. 1599, December 1968.

Occupational Outlook Handbook, Bureau of Labor Statistics, U.S. Dept. of Labor, Bulletin No. 1650, 1970.

Patterns of U. S. Economic Growth, Bureau of Labor Statistics, U.S. Dept. of Labor, Bulletin No. 1672, 1970.

Population Area Density 1970, Bureau of Research & Statistics, Mass. Dept. of Commerce and Development, February 1971.

President's Committee on Employment of the Handicapped Newsletter 1971, 1971.

Projections 1970-Interindustry Relationships Potential Demand Employment, U.S. Department of Labor, Bureau of Labor Statistics, Bulletin No. 1536, 1966.

Recent Statistical Data About Massachusetts Agricultural Sales and Expenditures, Department of Agricultural and Food Economics, Report 71-1, March 1971.

Review of Progress, Bureau of Elementary and Secondary Education, Department of Health, Education, and Welfare, February 1969.

Special Studies, "The Social and Economic Status of Negroes In the United States, 1970," U.S. Department of Commerce, Dept. of Labor, BLS Report No. 394, July 1971.

Standard Industrial Classification Manual,1967, U.S. Government Printing Office, Washington, D. C., 1967.

Standard & Poor's Register of Corporation Directors and Executives, United States and Canada, Standard & Poor's Corp. New York, 1970.

States in Perspective, Massachusetts - Federal Government Published Reports, 1969-1971.

Statistical Digest 1970, Commonwealth of Massachusetts Division of Employment Security, June 1970.

Statistical Profile Region Two 1971, Commonwealth of Massachusetts Executive Office for Administration and Finance Office of Planning and Program Coordination, 1971.

Survey of Current Business, U. S. Department of Commerce, Volume 51, July 1971.

Thomas Register of American Manufacturers, Thomas Publishing Company, 1968-1970. (Annual)

BIBLIOGRAPHY AND DATA SOURCES

Tomorrow's Manpower Needs, U. S. Department of Labor, Bureau of Labor Statistics, Volumes I-IV & Supplement No. 2, February 1969.

The Challenge of America's Metropolitan Population Outlook - 1960 to 1985, National Commission on Urban Problems, Report No. 3, 1968.

The Economy at Midyear 1971 with Industry Projections for 1972, U. S. Department of Commerce, Bureau of Domestic Commerce, 1971.

The U. S. Economy in 1980, U. S. Department of Labor, Bureau of Labor Statistics, Bulletin 1673, 1970.

Training and Jobs for the Urban Poor, Committee for Economic Development, 1970.

U.S. Census of Population, 1960, Massachusetts Detailed Characteristics, Bureau of the Census, PC(1)-23 D, 1962.

U.S. Industrial Outlook 1971 with Projections through 1980, U.S. Dept. of Commerce, Bureau of Domestic Commerce, February 1971.

Vision in Industry, Barkley and Dexter Laboratories, Inc., Fitchburg, Massachusetts, 1957.

ADDITIONAL LOCAL SOURCES OF DATA

Building Permits
Chamber of Commerce Publications
City Directories
City/Town Monographs
Employment Agencies
Employment Security (Division of)
Education Reports (Dept. of)
Industrial Plant Publications
Municipal Registers
Newspapers
Planning Board Reports
School Papers
Service Clubs
Social Service Agencies
Tax Records
Telephone Directories
Town Reports
Vehicle Registrations

SECTION III

SAMPLING OF OCCUPATIONAL EDUCATION RELATING TO CAREER DEVELOPMENT IN NORTHERN WORCESTER COUNTY

Barkley & Dexter Laboratories, Inc.
50 Frankfort Street, Fitchburg, Massachusetts

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS i

INTRODUCTION 1

  The Educational Institution 2

  Adult Education Programs 2

  Formal On-the-job Training Programs 3

  Informal Training 3

  Apprenticeship Programs 3

  Junior Achievement 3

  Related Federal and State Sponsored Programs 4

  Special Education Programs 5

  Boy Scout Programs Occupational Careers 5

  Project Transition, Armed Forces 5

SECONDARY SCHOOLS AND SECONDARY SCHOOL DISTRICTS 7

TABLE I - Student Enrollment Secondary Schools 8

FIGURE 1 - North Worcester County School Districts 10

FIGURE 2 - North Worcester County Vocational School Districts 11

OCCUPATIONAL EDUCATION OFFERINGS IN EDUCATIONAL INSTITUTIONS 12

TABLE II - OCCUPATIONAL EDUCATION OFFERINGS IN VOCATIONAL TECHNICAL HIGH SCHOOLS 13

TABLE III - OCCUPATIONAL EDUCATION OFFERINGS IN COMPREHENSIVE HIGH SCHOOLS 15

TABLE IV - OCCUPATIONAL EDUCATION OFFERINGS IN COMMUNITY COLLEGE 17

TABLE V - OCCUPATIONAL EDUCATION OFFERINGS IN FITCHBURG STATE COLLEGE (Evening Div.) 18

page

OCCUPATIONAL EDUCATION GOALS 19

OCCUPATIONAL EDUCATION IN SECONDARY SCHOOLS 20

- Preparation for Occupations in Business 20
- Health Occupations 28
- Skilled Trade and Industrial Occupations 30
- Technical Education 34
- Home Economics 36

SCHEDULING 38

OCCUPATIONAL EDUCATION AT COLLEGES 39

- Mt. Wachusett Community College 39
- Fitchburg State College 40

RESULTS OF SURVEY: DISTRIBUTION OF STUDENTS BY PROGRAMS 41

- Where do the High School Graduates Go? 41

TABLE VI 42

RESULTS OF CAREER INTEREST SURVEY AMONG HIGH SCHOOL STUDENTS 43

FIGURE 3 - STUDENT CAREER INTEREST SURVEY CARD 44

KEY TO TABLES VII, VIII, IX, X 45

TABLE VII ORDER OF PREFERENCE - FIRST CHOICE 46

TABLE VIII PREVIOUS SURVEY 47

TABLE IX MALES BY GRADE 48

TABLE X FEMALES BY GRADE 49

JUNIOR ACHIEVEMENT 50 - 51

APPRENTICESHIP PROGRAMS - TRADE UNIONS 52 - 55

OTHER RELATED EMPLOYER/EDUCATOR COOP PROGRAMS 56 - 57

SPECIAL EDUCATION AND REHABILITATION 58 - 60

CONCLUSIONS 61 - 62

ACKNOWLEDGEMENTS

Barkley & Dexter Laboratories, Inc., acknowledge the cooperation and assistance of the school administrators, guidance personnel and instructors in the public and non-public schools which serve the communities in the North Worcester County Study Area.

Special appreciation is expressed to the administrative personnel and instructors in the several Vocational Technical Schools in the Commonwealth who participated by providing information for this project. Two of these schools, Leominster Trade School and Montachusett Regional Vocational Technical High School are in North Worcester County.

We also wish to thank the many private and public organizations and agencies and their officials who gave of their time and cooperated in response to the many requests for information for this study.

FINAL REPORT MAY 1972

INTRODUCTION:

The preceding section of this report described the methods of determining future job opportunities and exemplified these methods in a model set up for N.W.C. (North Worcester County).

The objective of this portion of the study was to sample the occupational education courses currently being offered by the secondary schools in N.W.C. (See FIGURE 1 and FIGURE 2). In addition, other occupational training programs were reviewed in an effort to present a more complete picture of the career preparation opportunities. Although it has not been possible to examine every program in depth, it is felt that sufficient data has been gathered to present a meaningful review as it currently exists. The relationship of some of these programs to the handicapped and disadvantaged is also cited.

The student and/or worker has, at the present time, numerous career training opportunities. Some of these may not be available to everyone at all times because of the constraints of scheduling, transportation and timing.

The Educational Institutions offering occupational education programs include Fitchburg State College, Mt. Wachusett Community College and the public and private secondary schools serving the 23 communities of N.W.C. The latter includes some 28 junior and senior high schools as well as a regional vocational training school and a municipal trade school.

Adult Education Programs are conducted in a number of the secondary schools as municipal or town sponsored evening courses. While some of these programs are designed so that the participant may acquire or upgrade a skill which is related to an occupation, a number of courses are directed toward the avocations or hobbies of the individual.

Formal On-The-Job Training Programs are carried out by a number of employers in the area and deal primarily with acquiring specific task proficiencies. Some employer-sponsored study programs also exist. JOBS '70, a cooperative type of program has been successfully operating in this area and is included under Federal and State Manpower Programs. "Project Transition" is also an active on-the-job training program involving several employers in the area and is treated under Armed Forces Educational Program.

Informal Training - "Pick-up Skills" includes a wide variety of sources such as home training by a skilled parent or family member and also, informal skill acquisition by peripheral exposure such as the person at the "next bench". According to the Department of Labor[1] only 40% of all craftsmen (at that time) had learned their skill through formal training.

Apprenticeship Programs functioning in this area are supported by organized labor and include as examples, the occupations of electrician, carpenter and millwright. Some of these are carried out with the cooperative effort of the school system as, for example, the programs at Leominster Trade School.

Junior Achievement is a business education program in which some 300[2] high school students are currently participating. These students set up and manage their own small-scale companies under the guidance of adult advisors from business and industry.

1/ Formal Occupation Training of Adult Workers (U.S.Dept. of labor, Office of Manpower Automation and Training, Manpower/ Automation Research Monograph No. 2), December 1964

2/ A total of 375 have participated through the Fitchburg Center during the school year 1971-72. 300 of these are in N.W.C. model.

Related Federal and State Sponsored Programs include:

Employment Counseling
Aptitude and Proficiency Testing
Human Resources Development Program
Apprenticeship Training[1]
Manpower Development and Training Program
Retraining Extended Duration
On-The-Job Training[2]
Occupational Training in Redevelopment Areas
Work Experience Programs[3]
Assistance to Selective Service Rejectees
Community Action Program[4]
Experimental and Demonstration Projects

1/ This program promotes and develops apprenticeship training programs for the youth of the Commonwealth and for its industries. Promotes the furtherance of Standards necessary to assure the proper training of apprentices; brings together Management and Labor for the development of formal apprenticeship programs.

2/ The National Alliance of Businessmen, working with the U.S. Department of Labor and Massachusetts Division of Employment Security, have attacked the unemployment problem of the disadvantaged directly at its source, viz., create job openings by local employers. The Fitchburg Chamber of Commerce has acted as the coordinating agency in this area for the JOBS '70 Program which currently encompasses 29 companies and 87 job opportunities.

3/ This program is designed to expand the opportunities for constructive work experience and other training that are available to low-income families, including people who are present or potential recipients of public assistance, thereby helping them to find and hold gainful employment.

This is not to be confused with Work Study or Work Related Programs currently in effect in some secondary schools.

4/ Among other purposes, this program is designed to provide special remedial and other non-curricular educational assistance.

Special Education Programs are included in secondary schools in the model. For the most part, these students attend regular classes with other students but report to a special home room for activities and guidance which is tailor-made to their individual requirements. The special education programs in teacher training at Fitchburg State College have been well known for many years. Furthermore, the peripheral activities of these teachers, teacher trainees and students are recognized as being of inestimable value throughout the Commonwealth of Massachusetts. Other on-going programs are in operation at the Rutland Heights Rehabilitation Center and the North Worcester County Work Activities Center, Leominster, Mass. The latter is sponsored jointly by the North Worcester County Association for the Advancement of Retarded Children and the State Department of Mental Health.

The operations of the Nashua Valley Council of Boy Scouts includes eleven towns within the North Worcester County model. A current program with Explorer Scouts is oriented toward occupational careers with industry and business leaders acting as advisors and sponsors. Additionally, this group sponsors a periodic survey of career interests among the junior and senior high schools. Results of the most recent survey have been included on page 44 through page 49.

The "Project Transition" program is currently operating at Fort Devens and a number of industries located within the model are participating. During the last six months of a soldier's enlistment period, the individual may elect to participate in the program which permits up to 240 hours of on-the-job training with a local industry. In effect, this is a "release-time" program. Prior approval by the cognizant superior officer is required. The individual participant receives no pay from the business or industry but continues to receive his armed forces service pay. In addition, occupational education opportunities exist with the Armed Forces in those fields where the acquired skills are directly transferable to civilian life, as for example, electronic computer programming or vehicle maintenance. Other educational opportunities exist in the form of correspondence courses as well as "live" courses both on the base and off the base which are offered by nearby colleges. Within the N.W.C. model, Mt. Wachusett Community College is working in cooperation with Ft. Devens.

SECONDARY SCHOOLS AND SECONDARY SCHOOL DISTRICTS:

TABLE I, lists the secondary schools located within the model. The enrollment is also given for the school year 1970-1971. These schools consist of eight regional high schools, four municipal high schools, four junior-senior municipal high schools, seven junior municipal high schools, one campus school, four private high schools, two municipal trade/vocational[1] high schools and one regional vocational high school. The aggregate pupil enrollment applicable to N.W.C. is 19,826 corresponding to approximately 10 percent of the total 1970 N.W.C. population[2].

FIGURE 1 shows the school districts as they apply to public, comprehensive high school systems and FIGURE 2 shows the geographical coverage of the trade and/or vocational training schools in N.W.C.

1/ Fitchburg Vocational School now part of Montachusett Regional Vocational Technical School

2/ See page 16, Section I

TABLE I
STUDENT ENROLLMENT
Secondary and Upper Elementary Grades
School Year 1970-71

School	Location	Enrollment
Athol/Royalston Regional H.S.	Athol, Ma.	1,259
Bolton Jr. High School	Bolton, Ma.	83
The Bromfield School	Harvard, Ma.	341
Clinton Jr. Sr. High School	Clinton, Ma.	1,038
B. F. Brown Jr. High School	Fitchburg, Ma.	713
Fitchburg High School	Fitchburg, Ma.	1,474
Fitchburg Vocational H.S.	Fitchburg, Ma.	129
Holy Family High School	Fitchburg, Ma.	190
Holy Family Elementary Grades 7-8	Fitchburg, Ma.	70
McKay School - Grades 7,8,9	Fitchburg, Ma.	230
Memorial Jr. High School	Fitchburg, Ma.	830
Notre Dame High School	Fitchburg, Ma.	256
St. Bernards High School	Fitchburg, Ma.	725
St. Bernards Elementary Grades 7-8	Fitchburg, Ma.	147
Gardner Jr. High School	Gardner, Ma.	472
Gardner High School	Gardner, Ma.	1,261
Lancaster Jr. High School	Lancaster, Ma.	149
Carter Jr. High School	Leominster, Ma.	655
Leominster High School	Leominster, Ma.	1,223
Leominster Trade High School	Leominster, Ma.	274
May A. Gallagher Jr. H. S.	Leominster, Ma.	946
Lunenburg Jr. Sr. High School	Lunenburg, Ma.	1,020
Maria Assumpta Academy	Petersham, Ma.	50*

* Enrollment includes Students from Communities in N.W.C. only

TABLE I continued..

SCHOOL	LOCATION	ENROLLMENT
*Montachusett Regional Voc. Tech. H.S. (Fitchburg/Gardner/Ashby/Barre/Harvard/Hubbardston/Lunenburg/Royalston/Sterling/Winchendon)	Fitchburg, Ma.	430**
Murdock Jr. Sr. High School	Winchendon, Ma.	730
Narragansett Regional H.S. (Templeton/Phillipston)	Templeton, Ma.	864
*Nashoba Regional High School (Bolton/Lancaster/Stow)	Bolton, Ma.	478
Oakmont Regional Jr. Sr. H.S. (Westminster/Ashburnham)	Westminster, Ma.	917
*Quabbin Regional Jr.Sr. H.S. (Barre/Hubbardston/Hardwick/Oakham)	Barre, Ma.	621
*Tahanto Regional High School (Berlin/Boylston)	Boylston, Ma.	274
*Wachusett Regional High School (Princeton/Rutland/Sterling/Holden/Paxton)	Holden, Ma.	1,016
West Boylston Jr. Sr. H.S.	W. Boylston, Ma.	855
*Ralph C. Mahar Jr.Sr. H.S. (Petersham/Orange)	Orange, Ma.	106

*Enrollment Includes Students From Communities in N.W.C. only.

** Opened in 1971-72.

NORTH WORCESTER COUNTY

SCHOOL DISTRICTS

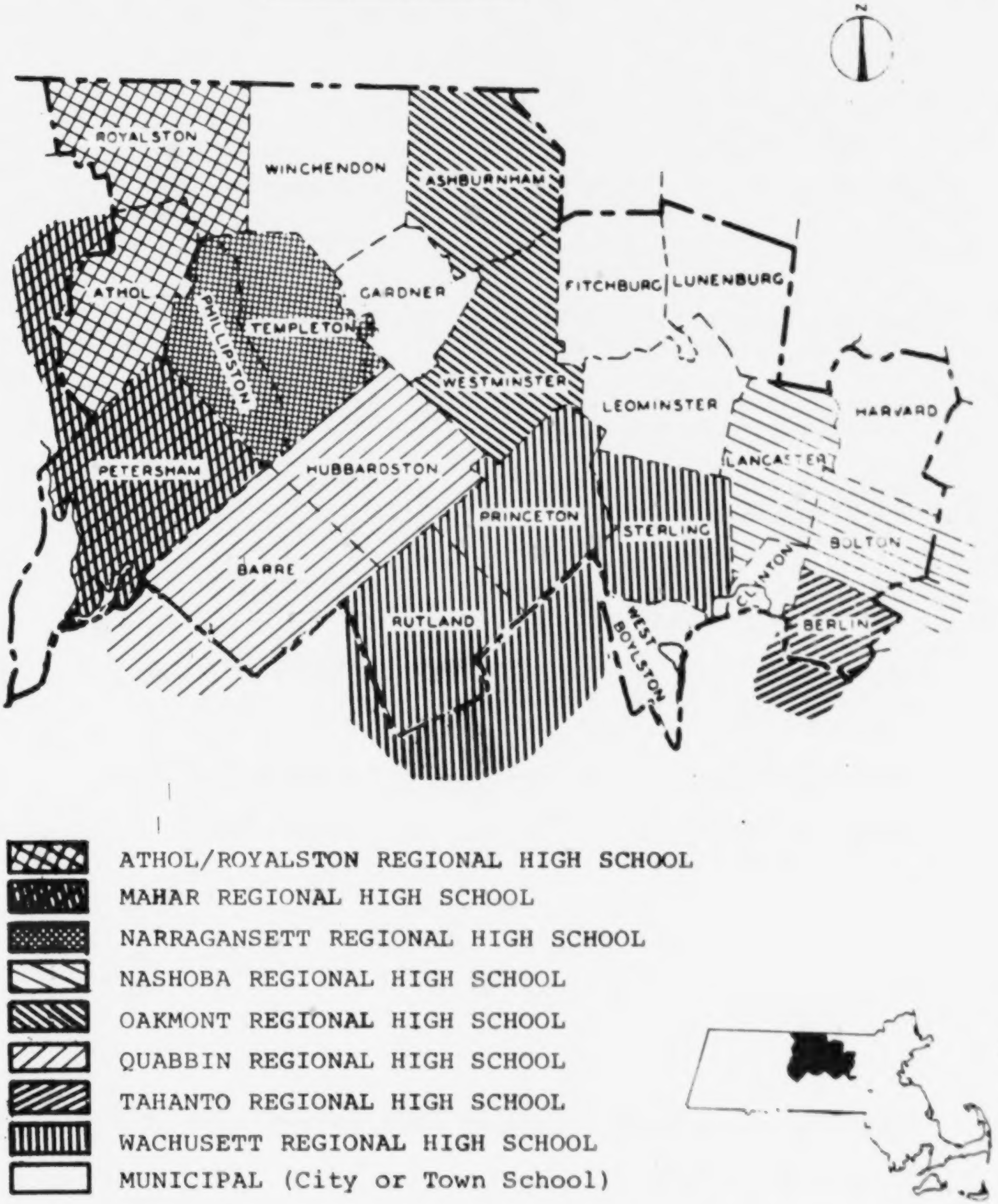
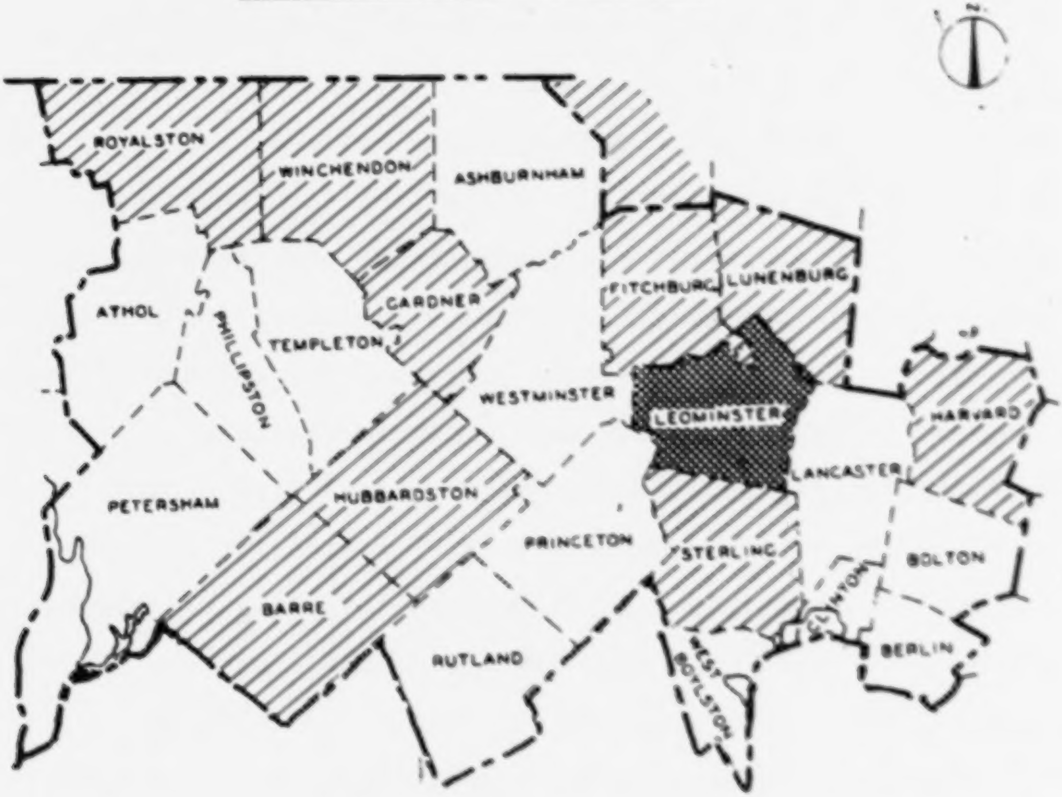

N
ROYALSTON
WINCHENDON
ASHBURNHAM
ATHOL
PHILLIPSTON
TEMPLETON
GARDNER
FITCHBURG
LUNENBURG
WESTMINSTER
LEOMINSTER
HARVARD
PETERSHAM
HUBBARDSTON
LANCASTER
PRINCETON
STERLING
BOLTON
BARRE
CLINTON
RUTLAND
WEST BOYLSTON
BERLIN
ATHOL/ROYALSTON REGIONAL HIGH SCHOOL
MAHAR REGIONAL HIGH SCHOOL
NARRAGANSETT REGIONAL HIGH SCHOOL
NASHOBA REGIONAL HIGH SCHOOL
OAKMONT REGIONAL HIGH SCHOOL
QUABBIN REGIONAL HIGH SCHOOL
TAHANTO REGIONAL HIGH SCHOOL
WACHUSETT REGIONAL HIGH SCHOOL
MUNICIPAL (City or Town School)

FIGURE 1

NORTH WORCESTER COUNTY

VOCATIONAL SCHOOL DISTRICTS


N
ROYALSTON
WINCHENDON
ASHBURNHAM
ATHOL
PHILLIPSTON
TEMPLETON
GARDNER
FITCHBURG
LUNENBURG
WESTMINSTER
LEOMINSTER
HARVARD
LANCASTER
PETERSHAM
HUBBARDSTON
PRINCETON
STERLING
BOLTON
CLINTON
BARRE
RUTLAND
WEST BOYLSTON
BERLIN

▨ MONTACHUSETT VOCATIONAL TECHNICAL SCHOOL

■ LEOMINSTER TRADE SCHOOL

☐ Served by Comprehensive High Schools

FIGURE 2

OCCUPATIONAL EDUCATION OFFERINGS IN EDUCATIONAL INSTITUTIONS:

Course offerings related to occupational education in the several N.W.C. high schools, as well as Wachusett Community College and Fitchburg State College, are shown in TABLE II through TABLE V. TABLE II lists the courses available at the Leominster Trade School and the Montachusett Regional Vocational Technical High School. The former has been in operation for many years and the quality of its programs and graduates are well known in the area. Montachusett Regional Vocational Technical High School (Monty Tech) is just completing its first operational year and represents a large step toward implementing occupational education. This first year has been a difficult one due to multitudinous start-up problems.

TABLE III enumerates the occupational education offerings available in the public comprehensive high schools. In certain cases, the school district may also be served by a vocational technical or trade school.

TABLE IV and V lists the occupational education offerings available at Mt. Wachusett Community College and Fitchburg State College respectively.

TABLE II

OCCUPATIONAL EDUCATION OFFERINGS IN VOCATIONAL-TECHNICAL SCHOOLS

Courses Offered	LEOMINSTER TRADE SCHOOL	MONTACHUSETT TECHNICAL-VOCATIONAL SCHOOL
Secondary School		
Air Conditioning, Heating & Refrigeration		X
Auto Body	X	P
Auto Mechanics	X	X
Appliance Repair		P
Carpentry	X	X
Commercial Arts & Industrial Design		X
Computer Occupations		X
Electricity	X	X
Electronics	X	X
Food Trades		X
Graphic Arts		X
Machine & Tool Design Drafting	X	X
Machine Shop Practices		X
Machinist-Moldmaking	X	
Metal Fabricating (Welding)		P
Plant Maintenance		X
Health Career	X	X
Home Economics & Services		X
Home Construction	X	
Hydraulics	X	
Child Development		X
Typing		X

TABLE II (continued...)

OCCUPATIONAL EDUCATION OFFERINGS IN VOCATIONAL-TECHNICAL SCHOOLS

Courses Offered	LEOMINSTER TRADE SCHOOL	MONTACHUSETT TECHNICAL-VOCATIONAL SCHOOL
Post Secondary School*		
Commercial Art		P
Computer		P
Dental Assistant		X
Drafting		X
Electronics (Electricity/ Hydraulics)	X	P
Food Trades		P
Health Services		P
Machine Tool Design & Drafting	X	P
Medical Assistant		X
Medical Lab. Assistant		
Nurses Aide	X	X
Practical Nursing	X	X
Rehabilitation Nurse Assistant		X

*Post graduate students may also enroll in Secondary level Technical Course.

X-Currently being offered.

P-Proposed

TABLE III

OCCUPATIONAL EDUCATION OFFERINGS IN COMPREHENSIVE HIGH SCHOOL

Courses Offered	Athol/Royalston Reg.	Clinton H.S.	Fitchburg H.S.	Gardner H.S.	Bromfield School	Leominster H.S.	Lunenburg H.S.	Murdock H.S.	Oakmont Reg.	Narragansett Reg.	Nashoba Reg.	Quabbin Reg.	Tahanto Reg.	Wachusett Reg.	West Boylston H.S.
Notehand														X	
General Business	X	X		X								X	X	X	X
Personal Typing					X	X						X	X		X
Typing I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Typing II	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Typing III	X	X	X			X				X				X	X
Stenography I	X	X	X	X	X	X	X	X	X	X		X		X	X
Transcription				X	X					X			X	X	X
Stenography II & Transcription	X					X	X					X	X		X
Stenography II		X		X			X	X		X			X	X	
Bookkeeping I	X	X	X		X	X	X	X	X	X	X	X			X
Bookkeeping II		X	X		X	X	X		X	X	X	X			X
Bookkeeping III												X			X
Business English			X									X			
Business Law		X		X		X	X	X			X		X		X
Record Keeping							X			X					
Secretarial Office Practice			X								X	X			X
Office Practice & Business	X		X			X	X		X	X	X			X	X
Machines				X			X	X	X	X		X	X	X	X
Clerical Office		X		X											
Practice	X	X	X	X				X		X	X	X		X	X
Business Arithmetic (Math)	X	X	X	X				X		X	X	X		X	X
Consumer Education	X			X					X	X	X		X		X
Accounting I				X									X		
Accounting II													X		
Business Economics											X				
Economics											X				
Salesmanship	X		X												
Data Processing	X												X	X	

TABLE III (continued..)

OCCUPATIONAL EDUCATION OFFERINGS IN COMPREHENSIVE HIGH SCHOOL

Courses Offered	Athol/Royalston Reg.	Clinton H.S.	Fitchburg H.S.	Gardner H.S.	Bromfield School	Leominster H.S.	Lunenburg H.S.	Murdock H.S.	Oakmont Reg.	Narragansett Reg.	Nashoba Reg.	Quabbin Reg.	Tahanto Reg.	Wachusett Reg.	West Boylston H.S.
Home Economics I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Home Economics II			X					X	X		X	X		X	X
Home Economics III															X
Home Economics IV															X
Foods I			X		X		X	X			X	X			
Clothing I	X		X		X			X	X			X	X	X	
Gen. Industrial Arts		X	X	X		X					X			X	
Industrial Arts,other				X						X			X		
Woodworking I	X	X	X			X			X	X	X	X	X		
Woodworking II	X	X	X							X		X		X	
Woodworking III												X			
Metals I	X	X	X			X		X		X	X	X			
Metals II												X			
Metals III												X			
Drawing Structures											X				
Engineering Drawing														X	
Mechanical Drawing I	X	X	X	X	X			X	X		X	X	X	X	X
Mechanical Drawing II	X		X		X			X	X	X	X	X	X	X	X
Mechanical Drawing III					X			X	X				X	X	X
Advanced Mechanical Drawing															X
Industrial Arts I	X	X	X	X	X		X	X	X		X		X	X	X
Industrial Arts II	X				X		X		X				X	X	X
Industrial Arts III	X				X		X		X				X		X
Industrial Arts IV	X						X						X		X
Graphic Arts		X	X												X
Power Mechanics									X						
Technical Drawing						X					X			X	
Electronics			X				X	X	X				X		
Electricity								X	X	X	X			X	
Manufacturing														X	

Source: Massachusetts Curriculum Study 1970-1971, October 1970.

TABLE IV

OCCUPATIONAL EDUCATION OFFERINGS IN COMMUNITY COLLEGES

Programs Offered	MT. WACHUSETT COMMUNITY COLLEGE
Business	
Accounting	X
Adm. & Mgmt.	X
Business Education	X
Business Technology	X
Data Processing	X
Industrial Management	P
Secretarial & Clerical	X
Health Services	
Mental Health Aides	X
Nursing-Registered	P
Technology	
Auto Technology	P
Computer Technology & Data Processing	X
Engineering & Industrial Technology	X
Electrical Engineering Technology	X
Furniture Technology	P
Mechanical Engineering Technology	X
Plastic Technology	X
Services & Miscellaneous	
Art	X
Fire Fighter Science Technology	X
Law Enforcement	X
Liberal Arts	X
Public Communications	X
Recreational Leadership	P
Science & Math	X
Teacher Aides	P
General Studies	X

X-Currently being offered.

P-Proposed

TABLE V

OCCUPATIONAL EDUCATION OFFERINGS IN STATE COLLEGES

Programs Offered	Fitchburg State College
Teacher Education	
Elementary Education	X
Special Education	X
Industrial Arts	X
Secondary Education	X
Health Services	
Nursing	X
Medical Technology	X
Rehabilitation - Linotype & Graphic Arts	X
EVENING DIVISION	
Technology	
Electrical Technology	X
Manufacturing Technology	X
Courses Offered:	
Introductory Circuits I	X
Introductory Circuits II	X
Introductory Circuits III	X
Electronics I	X
Electronics II	X
Electronics III	X
Electronics IV	X
Engineering Graphics I	X
Engineering Graphics II	X
Mechanics I	X
Mechanics II	X
Machine Design I	X
Machine Design II	X
Thermodynamics	X
Electrical Measurements	X
Digital Techniques	X
Assurance Engineering	X
Materials & Processes I & II	X
Strength of Materials I & II	X
Fluid Mechanics I	X

OCCUPATIONAL EDUCATION GOALS:

Occupational educational goals must of necessity relate to occupational opportunities. They must be synchronized to future demands and sensitive to the gross and subtle changes that occur as the economic, social and technological forces ebb and flow. Teachers and guidance councilors need current and updated information to present all of the occupational options to the students. If the student is to find his future career self rewarding and self fulfilling, then all of the factors which contribute to success in that field must be recognized and developed. Section II of this report catalogued the prospects for employment in several occupational fields and enumerated certain requirements and working conditions. Occupational education must be responsive to the needs of industry and business. It must be concluded, furthermore, that in addition to the manipulative and technical skills, the occupational education goals must include development of the social skills, amenities and an understanding of how business and commerce function.

Since the survival of commerce in N.W.C. is dependent, among other things, on the productivity of the worker, occupational education must assume a prominent role in the development of all of the attributes that contribute to worker productivity.

OCCUPATIONAL EDUCATION IN SECONDARY SCHOOLS:

Occupational education occurs in the secondary school system of N.W.C. in either the Vocational Technical or Trade School or in certain clusters of courses in the comprehensive high school. The latter, as the name implies, offers a wide variety of courses designed to prepare the student for college, certain business occupations and in a few cases, industrial work. The vocational technical school and the trade school are, by design, programmed for occupational education.

Preparation for Occupations in Business

A number of high schools offer a program under the heading of Business Curriculum. Some of the courses and activities are also common to programs in other schools which are identified as Office Occupations (Commercial Course) as well as Distributive Education. For the most part, the high school programs in the area have, for over a generation, identified certain office occupations and produced highly qualified employees, e.g., typists, stenographers and bookkeepers. Examination of Table III, page 15, indicates a preponderance of offerings directed toward specific office occupations[1]. The excellent reputation of several schools, both public and private, and in some cases, specific teachers, is

---

1/ These were the specific course offerings submitted to Massachusetts Curriculum Study 1970-1971. Admittedly, the course content cannot always be fully determined or appreciated from the title or even the syllabus course description. The difference between, for example, Bookkeeping II and Accounting I or Economics and Business Economics can often be a function of the particular school system, the teacher and/or the student body.

fairly common knowledge among employers and personnel directors in the area.

Business education does, however, encompass a broader body of related subject matter and learning experiences than typing, stenography and bookkeeping. This enlarged concept should be designed to develop in students the attitudes, knowledge, skills and understanding concerned with business principles.

Further examination of Table III indicates that a broader approach is being taken in some areas, notably, General Business, Business Law, Consumer Education and in some specific areas of Machine and Computer technology. On the other hand, one of the largest (by number) occupations, Salesman/Saleslady, is almost totally neglected in the formal curricula. Additionally, Business Economics, which is intended to explain and proliferate the system in which we function, is rarely found in the course offerings. Distributive Education and certain Work Study programs are attempting to fill these and other gaps by offering various combinations of subject matter and learning experiences. On-going Distributive Education as well as Work Study or Work Related programs exist in a number of secondary schools in N.W.C.

Distributive Education is comprised of programs of instruction and practice in the field of distributing and marketing goods or services. These programs are designed to prepare the individuals to enter the process of improved competencies in distributive occupations. The goal is to develop attitudes, skills and understanding in the marketing, merchandising and management fields. Distributive Education includes various combinations of subject matter and learning experiences related to the performance of activities that direct the flow of goods and services including their appropriate utilization from the producer to the consumer. These activities include buying, transportation, storing, promoting, financing, marketing, research and management. The instruction is structured to meet the requirements for gainful employment and enter apprenticeship in specific occupational levels. Distributive occupations are found chiefly in such areas of economic activity as retail and wholesale trade, finance, insurance, real estate, services and service trades. They are also found to a lesser extent in manufacturing, transportation, utilities and communications. Referencing page 45, Section II, the programs of distributive education are, in fact, a specific response to the current economic trends in N.W.C.

Work Related Programs - The trend is toward increasing the availability of Educational Work experiences in the High School. Many students today want and need the experiences which can be gained in Work Related activities.

Work Related Programs take several forms, as follows:

The "cooperative program" is an extension of classroom instruction into regularly scheduled paid employment in distributive occupations appropriate to each pupil's vocational objective. Usually, the school refers pupils to training situations for an average fifteen hours per week throughout the year; arranges for the on-the-job training and supervision and grants credit for successful application of classroom instruction in the training situation.

The "project program" is an extension of classroom instruction into regularly scheduled laboratory training in which each pupil practices with conditions of employment appropriate to his vocational activity. Usually the instructor assigns individualized projects through which desired occupational competencies may be achieved, coordinates participating activities with the requirements of representative business, arranges for some on-the-job training and approves credit for successful performance in school and in business laboratory environments.

"Work study" Program - The more recent trend in the area is toward offering the students "work study" programs. These programs are designed to provide work experiences in many diversified occupations. It enables the student to explore occupations which may be of interest and for which he has received no specific academic preparation.

Samplings of specific information gathered on business education programs in N.W.C. include:

Fitchburg High School where approximately 50% of the total school enrollment is currently involved in business-related programs. These include both Distributive Education and a Work Study Program. It is estimated that approximately 12% of the students are in the former and 10% in the latter. The difference between these two programs is that Distributive Education is primarily concerned with retail, wholesale businesses whereas Work Study may also include industrial and service-related occupations.

The occupational offerings in business-related courses at Murdock Jr/Sr High School (Winchendon) are restricted primarily to office occupations. A Work Study program is also currently in force. With the exception of certain Industrial Arts and technically-related programs (treated elsewhere) and recent participation in the regional vocational school, a large portion of the educational effort has been directed toward the college-bound student.

Lunenburg High School offers the usual commercial courses designed to provide occupational training in business office skills. In addition, an active and aggressive Work Study program is being pursued. This is a program by which a student may begin to work during high school in a job or area which he plans to pursue after graduation. The student is scheduled flexibly so as to permit release time from school for working. The specific job must be approved by the coordinators and employers must be in the Lunenburg, Fitchburg, Leominster, Clinton vicinity. Upon successful completion of 600 hours of work experience and attendance at bi-weekly seminars, one credit toward graduation is earned. During the current year, 160 signed up and approximately 20 participated. The chief problems are scheduling release time and the number of job opportunities.

The Bromfield School at Harvard has the lowest enrollment of any high school in N.W.C. Accordingly, its course offerings in business education are minimal. Compensatory practices include: individualized programs for students, i.e., not college preparation, not general course; participation in Montachusett Regional Vocational Technical School.

Leominster High School together with the Leominster Trade High School provides training in office occupations of typing, stenography and bookkeeping and office practice. A program of Distributive Education is offered in conjunction with local merchants. It has included some 15 to 18 seniors and is expanding. As in other schools, this program has not been in practice long enough to realize all of the benefits. Difficulties of scheduling as well as finding sufficient constructive employment opportunities have become apparent. Training and experience in business economics, data processing, office machines, computer technology is not available at this time.

Montachusett Regional Vocational Technical High School does not currently have a program related to business education as such. However, several of the course offerings include business-related subjects. Examples are: those courses dealing with computer occupations; typing - although the present purpose is as an ancillary function to supplement another major career choice (as for example: art work occupations or service occupations). The offerings currently available in remedial reading are believed to be most important in all other occupations as well as the business oriented ones.

Wachusett Regional High School - At this school, a business-related, training program is called "The New Three R's". The R's stand for Responsibility, Relevance and Resourcefulness. The program started in March 1971, with 25 seniors.

Currently there are approximately 150 students participating in the program and the responses are varied. Program is designed so that a student spends one day a week with his sponsor, that is from 8:00 A.M. to 2:00 P.M. This is without pay and is considered a regular school day. For this, the student receives course credit.

The faculty sponsor; i.e., teacher, has roughly 5 students that he or she works with. The participants are required to file periodic reports to better evaluate their achievements. Sponsors are also asked to file forms evaluating the students. The program runs from September to May and students are currently involved within the community in a wide variety of occupations such as shop apprentice, teacher aide, buyer assistant, therapist aide, farmer's helper, assistant bookkeeper, secretarial aide, weather service assistant, gym aide, engineering aide, mechanic, engravers apprentice, optometrist aide, bank aide, assistant town accountant, laboratory assistant, parks assistant, sales and service art aide, public relations and a long list of others.

Because this program has been received with enthusiasm, it is well to consider on a long-term projection, i.e., 5 years, that there will be increasing numbers of school systems using this type of experience to expose students to career opportunities within the community. In many respects, it is comparable to work study programs or distributive education in which many students currently participate. The Three R's program appears to be a means by which the academic and the industrial community can bridge the gap in communications through the vehicle, the student.

Health Occupations

Education for Health Occupations consists of a body of related subject matter or related courses and planned experiences designed to impart knowledge and develop understanding and skills required to support the Health professions. Instruction is organized to prepare pupils for occupational objectives concerned with assisting qualified personnel in providing diagnostic, therapeutic, preventative, restorative and rehabilitation services to patients. Training for these occupations as well as the para-professional occurs primarily in the Vocational and Trade School with a few limited exceptions.

The comprehensive high schools are primarily concerned with health and safety in daily living as well as physical education and recreation. This body of related subject matter in activities in health and safety in the daily living and physical education and recreation are organized for carrying on learning experiences concerned with developing: 1. Knowledge, attitudes, appreciation and conduct essential to individuals in group health. 2. Awareness of, concern for, and judgement necessary for participating in promoting personal and public safety in the home, at school, on the job and in traffic. 3. Physical and mental growth and fitness by means of activities designed to improve the muscles, motor skills and the attitudes or habits of conduct of individuals and groups.

Both Leominster Trade School and Montachusett Regional Vocational Technical School offer "Health Career"[1]. In addition, the latter institution offers a program for Dental Assistant, Medical Assistant, Nurse's Aide, Practical Nursing and Rehabilitation Nurse Assistant as a post-graduate study. Leominster Trade School offers Nurse's Aide and Practical Nursing as post-graduate secondary training.

1/ See Table II

Skilled Trade and Industrial Occupations

Skilled trade and industrial occupation is the branch of vocational education which is concerned with preparing persons for individual employment or for upgrading or retraining workers in a wide range of trades and industrial occupations. Such occupations are skilled or semi-skilled and are concerned with designing, manufacturing, processing, assembling, testing, maintaining, servicing or repairing any product or commodity. Instruction is provided:

1. In the basic manipulative and operative skills, safety related occupational information, in mathematics, drafting and science required to perform successfully in the occupation.

2. Through a combination of shop and/or laboratory experiences simulating those found in industry. Included is instruction for apprenticeship in the various trades and training for service and certain semi-professional occupations considered to be trade and industrial in nature.

Opportunities are frequently provided during and outside regular class time for pupils to develop interest, skills and knowledge in selective aspects of trade and industrial occupations as an integral part of their instructional program.

Table II lists the offerings available at the Leominster Trade High School and the Montachusett Regional Vocational Technical School. Most of these courses have been established in concert with expressions of opinions of various representatives of business and industry in the area.

The Leominster Trade High School has had an established program for many years which is highly respected by industrial and skilled craft employers. The carpentry program, drafting, machine shop (including mold making), and auto mechanics is recognized throughout the area as a source of skilled labor. The program of combined electricity and hydraulic studies is unique in approaching the problem of automatic machinery maintenance. In their senior year students may elect, if eligible, a Co-op Program. Here they work in industry on alternate weeks instead of in the school shops.

Montachusett Regional Vocational Technical School has, as of this writing, been operational for only one school year. In addition to the usual start-up problems, difficulties have included operating with an unfinished plant as well as incomplete internal facilities. Student enrollments have experienced several obstacles, viz., geographical - some students do not like to be separated from their "home" high school; some students have identified with their local sports activities which would be displaced by going to "Monty"; many students (and some adults) have not had the opportunity of realizing the full import of the vocational opportunities at

"Monty" and the fact that an increasing number of career opportunities lie in vocational education in contrast to alternative educational institutions. All of the foregoing problems have been recognized and solutions are being undertaken. This school can represent, in the future, the largest single source of skilled occupational education graduates in the area. It is expected that contributions in the areas of the food trades, graphic arts, computer peripheral service, health occupations will be significant within the next few years.

The Comprehensive High Schools in the area also offer programs and courses which provide occupational training in the area of skilled trade and industrial occupations. These include the industrial arts programs as well as the several individual structured sub-programs and/or courses as delineated in Table III. Some of these programs are based on "tradition" and others are the result of a specific response to the innovativeness or competency of a particular teacher, the goals of the school administration or the guidance of the school committee.

The Junior High Schools also offer Industrial Arts Programs wherein the student is exposed to woodworking, metal working, graphic arts and, in a few cases, some other miscellaneous technologies. For some students this is the first exposure to the use of tools and the manipulative skills. As such, it fulfills a definite need not only for the occupational training, per se, but it supplies a general knowledge and background so necessary for the task of making a career choice. This could be, perhaps, more important for the disadvantaged than others. Many industrial leaders, scientists and educators have expressed the thought that "everyone" should, at some time or other, be exposed to the use of hand tools to "keep them practical".

In several of the schools visited, both Junior and Senior High Schools, there appeared to be chronic problems in space allocation, equipment availability and in some cases, pupil interest.

Except in rare cases, there was very little coordination or continuity between Junior High programs and Vocational or Comprehensive High School occupational programs. Additional observations made include:

Some "woodworking courses" appeared to be the result of historical or traditional happenstance rather than any real need or demand on the part of either the local industries or desires of the students. Other programs in carpentry, however, provide a real-life, working experience and a "stepping stone" into the trade.

Some courses in drafting were excellent and fulfilled a real need for developing the student's ability to visualize in three dimensions. Other drafting courses, however, were unrelated to needs of local industry and contribute little to the student's development.

Similar detailed analysis can be made for other courses offered under the heading, "metals" and "electronics".

Technical Education

Technical education is comprised of that body of knowledge organized in planned sequence of classroom and laboratory experiences to prepare pupils for a cluster of job opportunities (or as prerequisites to further study) in a specified field of technology. The program of instruction may include the study of the underlying sciences and the supporting mathematics inherent in the technology as well as methods, skills, materials and processes commonly used and services performed in the particular technology. The planned sequence of study and extensive work in the field of specialization is required in technical education as well as competency of the basic communication skills and related general education. Technical education prepares for those occupational areas between the skilled craftsman and the professional person such as the physician, engineer and the scientist.

The technical educational curriculum is so structured that it prepares the graduates to enter a job and be productive with a minimum of additional training after employment. It is designed to provide a background of knowledge and skills which enable an individual to advance with the development in the technology and, with a reasonable amount of experience, to further advance into positions of increased responsibility.

The technician is frequently employed in direct support of professional employees. For example, the engineering technician will be capable of performing such duties as assisting and following engineering functions such as: designing, development, testing, modifying of products and processes, reduction planning, writing reports, preparing estimates, analyzing and diagnosing technical problems that involve independent decisions and solving a wide range of technical problems by applying his background in the technical specialties/science, mathematics, communicative and citizenship skills.

Heretofore, the technical education in the secondary schools has been primarily oriented toward the college bound student. More recently, the offerings at Montachusett Regional Vocational Technical School, Leominster Trade High School and a few of the high schools, have begun to direct courses aimed at satisfying this need. The evening courses available at Fitchburg State College and the day and evening courses at Wachusett Community College (treated in a later section) have also become quite important to the students of this area.

Home Economics

The comprehensive high schools in this area, for the most part, all offer home economics. See Table III. These programs have been traditionally geared toward females, however, the trends of late indicate that males are participating in some courses. These courses are predominantly in the cooking and sewing areas.

The fundamental differences in Home Economic programs between comprehensive high schools and the vocational high school lie in the objective of the course offerings. The vocational technical high school is primarily concerned with occupational preparation.

The courses or units of instruction emphasize the acquisition of competencies needed for getting and holding a job and/or preparing for advancement in an occupational area using home economic knowledge and skills. Instructional content is selected from home economic areas to meet the unique requirements in specific occupations and is coordinated with appropriate field, laboratory and work experiences. Occupations include those which provide: 1. Services to families in the home and similar services to others in group situations. 2. Assistance to professional home economists and professional fields related to home economics in industries, agencies and organizations. 3. Other services and/or assistance directly related to one or more home economic subject matter areas.

Related subject areas include care and guidance of children, clothing management, production and services; food management, production and services; home furnishings, equipment and services; institutional and home management and supportive services.

In general, the offerings of the N.W.C. area schools under Home Economics, Clothing, Foods, are considered of good caliber and quite abreast of the times. As with many academic subjects, the program content and quality varies from school to school and is strongly influenced by the capabilities of the particular teacher.

The child care course at Montachusett Regional Vocational Technical School in synchronism with the guidance-study work with the disadvantaged mother is fulfilling an important local need.

SCHEDULING:

The academic schedule in most of the schools in Northern Worcester County which have been surveyed is probably the most significant limiting factor in occupational education. Teachers, school superintendents and guidance counselors all recognize the impasse which can occur with a schedule conflict. In those systems where a student wants to take an occupational course and must adhere to a rigid academic schedule, the conflict is most acute. Some occupational laboratory or shop courses cannot be gainfully pursued in a single forty or forty-five minute period. In some cases, even two periods back-to-back are inadequate. Instances have been found where a rotating block schedule is employed so that not all teachers have an 8:00 A.M. to 9:00 A.M. class every day of the week or a late afternoon class, 2:00 P.M. to 3:00 P.M. every afternoon. This accommodation to the teacher can result in restrictions in the student's choices. Work study and other release time programs also cause problems in the academic schedule is rigid.

OCCUPATIONAL EDUCATION AT COLLEGES:

Mt. Wachusett Community College

This community college fills an important role in occupational education in N.W.C. It offers both a day and evening program. Not only does it supply 2-year graduates trained for a variety of occupations, but it also prepares students for transfer to other institutions of higher learning. Table IV lists the course offerings and it can be seen that in addition to the Business, Health and Technical occupations, Mt. Wachusett Community College supplies training which is unique to this area, viz., Fire Fighting Science Technology, Law Enforcement and Public Communications.

Courses in Plastic Technology, Industrial Management, Furniture Making and Furniture Technology are available but have not aroused very much interest.

Other courses being projected include nurses training, health technician, recreational leader, teacher aide and automobile technology. All of these courses are projected for the new campus which should be available in about two years.

The Curriculum Committee of the college is composed of professional and business people who volunteer advice on program objectives.

It is felt by some of the college administrators that, if the two-year college is to be viable within the concept of career education, courses must be offered that will allow students to obtain employment at the end of the first year, with the second year given to broadening and improving the skills acquired in the first year.

Fitchburg State College - Evening Undergraduate Division

Fitchburg State College offers degree programs in Education, Health Services and Liberal Arts. In this report, attention is focused on the evening division programs which relate to occupational education.

In the early 1950's, the Evening Undergraduate Division conducted an apprentice training program in cooperation with the General Electric Company of Fitchburg. For many years, the college has included in its educational services, other areas of regional interest, e.g., special courses in linotype operation for state rehabilitation programs.

TABLE V lists the programs and occupationally related courses currently being offered. In addition to Associate degrees, the college also offers a Bachelor of Science degree in Industrial Science with major concentration in electrical or manufacturing technology.

The evening programs provide technical education for people in industry and business who require additional knowledge to keep pace with changing job demands. The programs offer flexibility to the student who may wish to take a limited skill program or fulfill a formal degree requirement. The Associate degree requires four years to complete on a part-time basis and the Bachelor of Science degree requires eight years if confined to evening courses. The student may elect to transfer to a full time day status after the completion of two years.

In North Worcester County, Fitchburg State College alumni are well represented in industry, commerce and education.

RESULTS OF SURVEY: DISTRIBUTION OF STUDENTS BY PROGRAMS

Where Do the High School Graduates Go?

A survey of nine secondary schools in N.W.C. was made to determine the distribution of student enrollment in the various traditional course groupings, viz., College, Commercial, General, Vocational.

The activities of the graduate, viz., college, technical training, military or work was also determined as well as the location of the graduate, viz., left community or located within the community. The results are shown in Table VI.

TABLE VI

RESULTS OF SURVEY: DISTRIBUTION OF STUDENTS BY PROGRAMS
(Where Do the High School Graduates Go?)

SCHOOLS:	Bromfield H.S.	Murdock H.S.	Narragansett Regional H.S.	Lunenburg H.S.	Nashoba Regional H.S.	Athol H.S.	Gardner H.S.	Fitchburg H.S.	Leominster H.S.
TOTAL 1971 Graduates By School:	36	103	115	159	162	168	263	466	420*
PROGRAM TAKEN IN H.S.:									
COLLEGE	58.3%	**	52.2%	40%	45%	**	60%	35%	35%
COMMERCIAL	13.8%	**	18.3%	25%	20%	**	10%	55%	29%
GENERAL	27.8%	**	28.7%	20%	35%	**	30%	10%	10%
VOCATIONAL			0.8%						26%
OTHER									
Work Study		5%		15%					
GRADUATE PLACEMENT:									
SR. COLLEGE	46%	25%	25.2%	28%	30%	25%	40%	36%	35%***
JR COLLEGE	8%	25%	23.5%	>18%<	15%	30%	25%	19%	15%
TECH. TRAIN.	8%	5%	17.4%		11%	10%	9%	5%	23%
MILITARY		5%	6.9%	2%	7%	4%	3%	5%	3%
WORK	38%	40%	27.0%	52%	37%	30%	23%	35%	24%
GRADUATES LOCATE : (1-5 yrs)									
Remain in Community	40%	55%	44%	60%	65%		****	78%	50%
Leave the Community	60%	45%	56%	40%	35%	*****	****	22%	50%

---

* Includes Trade School

** Do not classify students; program "tailor made" for each student in terms of indicated interests

*** Does not include trade school

**** Unknown

***** Large number % unknown

CAREER INTEREST SURVEY:

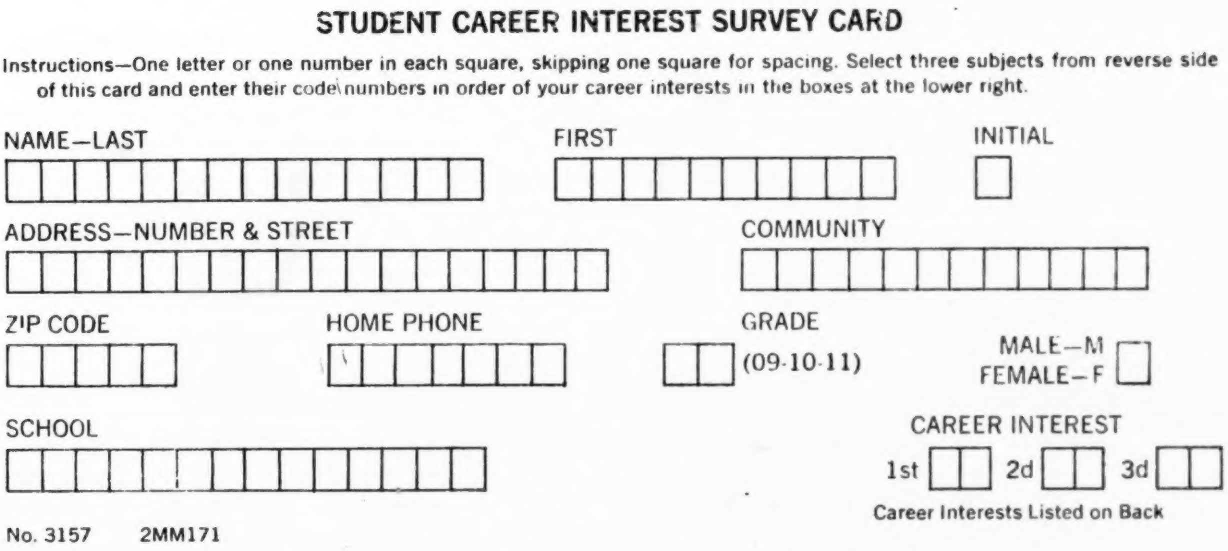
A Career Interest Study (using the card shown in Figure 3) was conducted in September, 1971 by the Nashua Valley Council, Boy Scouts of America No. 230, involving the following schools (10 of which are located in our geographical model):

No. Students Responding	School	Grades Surveyed
1041	Acton/Boxboro High School	9/10/11
627	*Ayer High School	9/10/11
135	Bromfield High School	9/10/11
194	Carter Junior High School	9
601	Clinton High School	9/10/11
1579	Fitchburg High School	9/10/11/12
282	May A. Gallagher Jr. High School	9
287	*Groton High School	9/10/11
842	Leominster High School	10/11
321	Littleton High School	9/10/11
472	Montachusett Reg. Tech. Voc. Sch.	9/10/11/12
357	Nashoba Regional School	9/10/11
195	Notre Dame High School	9/10/11
485	St. Bernard's High School	10/11/12

This interest card was completed by a total of 7,418 students, grades 9 through 12 inclusive.

* Not in N.W.C. Model

FRONT



STUDENT CAREER INTEREST SURVEY CARD

Instructions—One letter or one number in each square, skipping one square for spacing. Select three subjects from reverse side of this card and enter their code numbers in order of your career interests in the boxes at the lower right.

NAME—LAST

FIRST

INITIAL

ADDRESS—NUMBER & STREET

COMMUNITY

ZIP CODE

HOME PHONE

GRADE (09-10-11)

MALE—M ☐
FEMALE—F ☐

SCHOOL

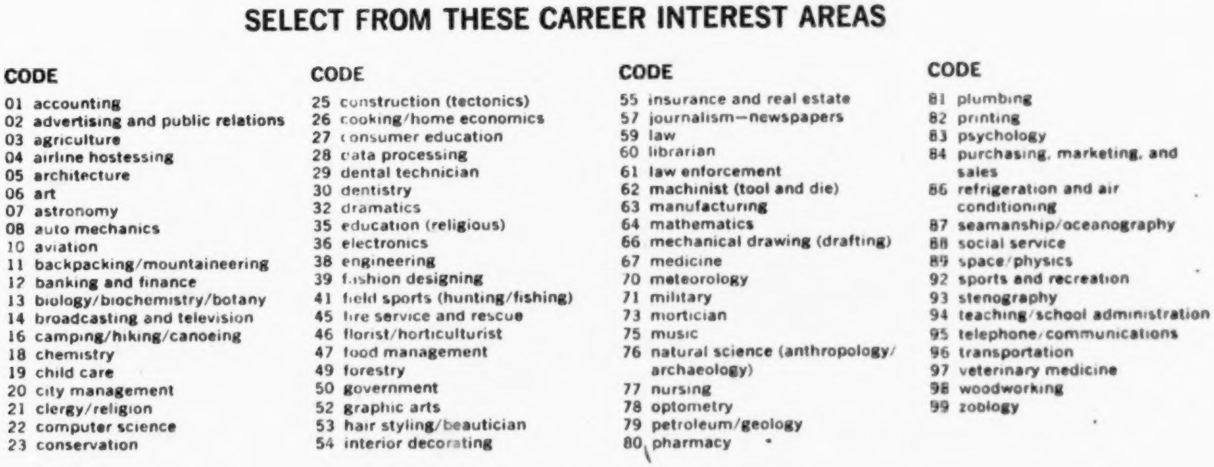
CAREER INTEREST

1st ☐☐ 2d ☐☐ 3d ☐☐

Career Interests Listed on Back

No. 3157 2MM171

BACK



SELECT FROM THESE CAREER INTEREST AREAS

CODE	
01	accounting
02	advertising and public relations
03	agriculture
04	airline hostessing
05	architecture
06	art
07	astronomy
08	auto mechanics
10	aviation
11	backpacking/mountaineering
12	banking and finance
13	biology/biochemistry/botany
14	broadcasting and television
16	camping/hiking/canoeing
18	chemistry
19	child care
20	city management
21	clergy/religion
22	computer science
23	conservation
25	construction (tectonics)
26	cooking/home economics
27	consumer education
28	data processing
29	dental technician
30	dentistry
32	dramatics
35	education (religious)
36	electronics
38	engineering
39	fashion designing
41	field sports (hunting/fishing)
45	fire service and rescue
46	florist/horticulturist
47	food management
49	forestry
50	government
52	graphic arts
53	hair styling/beautician
54	interior decorating
55	insurance and real estate
57	journalism—newspapers
59	law
60	librarian
61	law enforcement
62	machinist (tool and die)
63	manufacturing
64	mathematics
66	mechanical drawing (drafting)
67	medicine
70	meteorology
71	military
73	mortician
75	music
76	natural science (anthropology/archaeology)
77	nursing
78	optometry
79	petroleum/geology
80	pharmacy
81	plumbing
82	printing
83	psychology
84	purchasing, marketing, and sales
86	refrigeration and air conditioning
87	seamanship/oceanography
88	social service
89	space/physics
92	sports and recreation
93	stenography
94	teaching/school administration
95	telephone/communications
96	transportation
97	veterinary medicine
98	woodworking
99	zoology

FIGURE 3

KEY TO TABLES:

TABLE VII shows the order of preference for first choice when all results are summarized.

TABLE VIII shows the results of an earlier survey, 1970, involving some 3800 students from Ayer, Clinton, Leominster and Fitchburg.

TABLE XI shows the order of preference, (Popularity Rating) for first choice for males and is broken down by grade.

TABLE X is the same as Table IX except that it is for females.

It can be seen that if the students fulfill their present ambitions, there will be no shortages of auto mechanics, ball players, teachers and nurses.

TABLE VII

CAREERS (FIRST CHOICES) - IN ORDER OF PREFERENCE

1. Teaching and School Administration
2. Sports and Recreation
3. Auto Mechanics
4. Nursing
5. Art
6. Medicine
7. Child Care
8. Electronics

TABLE VIII

An earlier survey conducted in 1970 (involving 3800 students from Ayer, Clinton, Leominster and Fitchburg) showed the following 10 careers had the greatest first choice interest:

1. Teaching
2. Art
3. Medicine & Nursing
4. Accounting
5. Engineering
6. Auto Mechanics
7. Electronics
8. Sports and Recreation
9. Data Processing
10. Natural Sciences

TABLE # IX

SUMMARY CAREER INTERESTS

OF ALL SCHOOLS SURVEYED

MALES

Popularity Rating	9th Grade	10th Grade	11th Grade	12 th Grade
1	Auto Mechanics	Auto Mechanics	Sports & Recreation	Auto Mechanics
2	Sports & Recreation	Sports & Recreation	Auto Mechanics	Teaching/School Administration
3	Electronics	Electronics	Electronics	Accounting
4	Field Sports/Hunting/ Fishing	Field Sports/Hunting/ Fishing	Engineering	Electronics/Military
5	Woodworking	Law	Law	Woodworking/Law/ Engineering
6	Law	Engineering	Woodworking	Sports & Recreation
7	Engineering	Teaching/School Administration/Woodworking	Teaching/School Administration	Field Sports/Hunting/ Fishing
8	Accounting/Veterinary Medicine	Accounting	Accounting	*
9	Teaching/School Administration/Military	Veterinary Medicine	Field Sports/ Hunting/Fishing	*
10	*	Military	Military	*

* CHOICE TOO DIFFUSE

TABLE # X

SUMMARY CAREER INTERESTS

OF ALL SCHOOLS SURVEYED

FEMALES

Popularity Rating	9th Grade	10th Grade	11th Grade	12 Grade
1	Teaching/School Administration	Teaching/School Administration	Teaching/School Administration	Teaching/School Administration
2	Child Care	Nursing	Nursing	Nursing
3	Airline Hostessing	Airline Hostessing	Stenography	Child Care
4	Nursing	Child Care	Airline Hostessing	Stenography
5	Art	Stenography	Child Care	Art/Medicine
6	Stenography	Art	Art	Airline Hostessing
7	Medicine	Medicine	Medicine	Psychology
8	Veterinary Medicine	Social Service/Hair Styling/Beautician	Social Service/ Psychology	Social Service
9	Social Service	Psychology	Hair Styling/ Beautician	Hair Styling/Beautician
10	Psychology	Veterinary Medicine	*	Law
11	Sports & Recreation	Sports & Recreation	*	Sports & Recreation/ Veterinary Medicine
12	Law	Law	*	*
13	Hair Styling/ Beautician	*	*	*

*CHOICE TOO DIFFUSE

JUNIOR ACHIEVEMENT:

Junior Achievement is a business education program in which high school students organize and manage their own small-scale companies under the guidance of adult advisors from business and industry. Each September the program is presented to the students in the following high schools: Fitchburg, St. Bernard's, Leominster, Gardner, Winchendon and North Middlesex Regional[1]. During the past year, 21 companies have been operative with a total student participation of 375. Although designed for any interested high school student, Sophomores and Juniors usually prove to be the best candidates. Some selection is necessary with Freshmen. There is, for the most part, more competition for the time of Seniors, viz., other extra curricula activities and part-time jobs. For those who participate, there is an opportunity to learn at first hand how the free enterprise system functions. Each decision-making detail that occurs in a real business operation, has its counterpart in the J.A. company.

At the present time, academic credit is being given by North Middlesex Regional High School based on pass/fail criteria of participation and contribution to the operation as well as attendance.

Constraints on the existing operations in the opinion of the executive director, include: (1) Financial - in that, present quarters and budgets are inadequate to permit other than meager expansion (2) transportation - evening attendance

---

1/Outside N.W.C. Model

by students depends to a large extent on being chauffered by parents; (3) high crime rate - has in some cases, deterred student activity in selling their product and other after-dark activities in certain sections.

It is proposed to explore the possibility of operating a company with the disadvantaged and/or handicapped by offering a program at the North Worcester County Work Activities Center in Leominster during the coming year.

APPRENTICESHIP PROGRAMS SPONSORED BY SOME TRADE UNIONS (N.W.C.):

The International Brotherhood of Electrical Workers, Local 96, reports that approximately 250 people between the ages of 18 and 25 apply yearly for the apprenticeship program within the union.

The application procedure requires that applicants be high school graduates and receive a passing grade in an aptitude test administered by the Department of Employment Security. The applicants are then interviewed by a local union representative and selections made.

Last year 15 people were selected from approximately 250 applicants for the apprenticeship program.

Apprentices train for four years and, upon completion of this training, are eligible to apply to the union for a qualifying examination as journeyman electrician.

The Carpenters & Millwrights Union, Local 107 of Worcester, which represents some of N.W.C. study area, follows very closely the methods employed by other unions for accepting applicants into their apprenticeship program. Of 32 people given aptitude tests last year by the Department of Employment Security, 15 passed the tests and were accepted into the program. Five of the 15 people qualifying were veterans.

Classroom training of 150 hours annually, given at Worcester Trade School, consists of a standard training program developed by the Training Committee at the National Headquarters of the Carpenters & Millwrights Union.

Carpenters & Millwrights Local 48 of Fitchburg reported a total of 18 people presently enrolled in the four-year program. The number of apprentices accepted annually is based on the total number of journeymen in a given local. The rule states that there should be one apprentice for every five journeymen.

Procedures for screening and testing applicants is similar to other unions and locals: aptitude tests given by the Department of Employment Security and a final screening by union representatives. The required training courses are offered two nights a week at Montachusett Regional Vocational Technical School and Leominster Trade School. Training is open primarily to union apprentices, but it is possible for people outside the union to take these courses.

There are 22 people enrolled in the training courses at the present time and all are union members. The dropout rate is very low.

The Bakers & Confectionery Workers Local 251 does not conduct a regular apprenticeship program.

Baking today is a highly automated process requiring little or no knowledge of traditional baking methods. Union membership is automatic after a trial period of 31 days. At this time, the end of the trial period, the trainee becomes a full member of the union with all rights and obligations as stipulated in the union contract in effect at his or her place of employment.

Traditional bakers, bench or hand-type bakers, still exist but work in the relatively rare specialty shop or supermarket which has its own bakery. It is very difficult for a beginner or graduate of a trade school to gain employment in the traditional bakery, as the specialty shops are quite often family-run operations and the supermarket jobs, because of higher pay scales paid, are much sought after by people already expert in the trade.

Plumbers and Steamfitters, Local 92, Fitchburg

The Plumber's and Steamfitter's Union are combined to form one Local with an approximate membership of about 200. The apprenticeship program is open to men 18-25 years old who qualify as a result of a written examination and personal interview. The formal program is five years in duration and combines work and related technical education. Each candidate must complete 150 hours of class work per year with a minimum of 70% average to advance to the next increment or level. With the successful completion of each level, the candidate receives a wage increase. An apprentice can be dropped from the program or held back for not completing the requirements. The current five year apprenticeship program has 20 apprentices. This year, there were 13 men who qualified for acceptance, however, only one opening has become available.

The formal apprenticeship courses are conducted two evenings per week at Leominster Trade High School. Courses include the trade basics plus a concentration in welding and more recently expanding into the field of air conditioning and refrigeration.

The local union is attempting to provide more technical education courses for all members. This training can aid a member to remain competitive in the very highly competitive construction industry.

OTHER RELATED EMPLOYER/EDUCATIONAL PROGRAMS:

Business and Industry participation in cooperative education programs is on the increase. Currently the U.S.O.E.[1] is involved in developing an Employer-based Career Educational Model. This model is designed to meet the individual learning needs of a cross-section of young people, ages 13-18, who are seeking a significant alternative to their current educational environments. Each implementation of the model will be directed by a consortium of public and private employers. The goals are to provide a comprehensive and rewarding educational program and to demonstrate the relevance of the educational process through intimate student involvement in professional and industrial operations.

The goals of the Employer-based Model are:

1. To provide an alternative education program for students, ages 13-18, in an employer-based setting.

2. To unify the positive elements of academic, general and vocational curricula into a comprehensive career education program.

3. To increase the relevance of the world of education to the world of work.

4. To broaden the base of community participation, particularly by involving public and private employers more directly and significantly in education.

1/ United States Office of Education

There are two significant occupationally oriented programs currently being offered as cooperative programs between Business and Education in our study area.

The first program involves participation with school guidance and administration personnel; Career Guidance Institute and the second involves students, Junior Achievement (previously described).

The Career Guidance Institute which is sponsored by the National Alliance of Businessmen is a locally designed and operated educational program involving high school educators and businessmen. This has been sponsored by the Fitchburg Chamber of Commerce and the Fitchburg State College.

The primary objectives of the Career Guidance Institute are:

1. To increase the awareness of educators and employers of the requirements of career preparation for disadvantaged students.

2. To improve the career guidance provided these students by increasing educator knowledge of private sector job conditions.

3. To increase the number and intensity of contacts between educators and businessmen.

SPECIAL EDUCATION AND REHABILITATION PROGRAMS:

The concept of Special Education in N.W.C. has varied considerably in the last few years. In many cases in the past, special education pupils were housed in one building with the object of employing specially trained teachers and special facilities to improve the development of slow-learning pupils.

It is now more common practice to have the slow-learning students report to a special homeroom but attend regular classes with other students. Programs are determined on an individual basis and special help is offered in those subjects with which the student is having the most trouble, e.g., remedial reading.

Several communities offer special education courses and guidance for students through age 16. At this point, programs are available at the Rutland Rehabilitation Center and other institutions if desired.

In Fitchburg, for example, services for the mentally retarded are currently being received by 125 people, with an additional 50 or so borderline cases which would be better served in the program, but due to the lack of physical space, cannot be accommodated.

Attempts are being made to establish programs for the mentally retarded that will give specific training at repetitive tasks as well as exposure to the needs for discipline and acceptance of criticism.

The Rutland Rehabilitation Center offers a resident training program for approximately 100 students. Extended employment centers operating in conjunction with the Rutland

Center offers training for specific jobs (See Page 5). Recent allocations of funds for a further extension of community programs will make it possible to increase the number to approximately 500 students.

The current number of 500 students is still below the total demand of 700 which was projected by the Commonwealth of Massachusetts in 1968 for Region II. The Rutland Center provides programs and services for the five areas which make up Region II. Two of these five areas are in the geographic study model. Thus it is projected that approximately two-fifths of the training requirements will take place in N.W.C.

Training programs consist of two basic types. The first is for the student who can function on his own within the community after training. The second is for persons who can be trained to do simple tasks but must be supervised and sheltered. Experience has shown that about half of the students in the training program eventually are assimilated into the community-at-large while the other half will function under supervision.

The Rutland concept of training has not been directed at specific occupations but rather at exposing the student to the work discipline required to hold a job. Points stressed include: punctuality, work related attitudes and criticism as to the ability of the student. The training for specific work is left to the employer.

When job placement opportunities are found, it is customary for a counselor to accompany a student to the job interview. The counselor explains to the prospective employer existing limitations as well as the attributes involved. The counselor also helps the student fill out the job application as quite frequently there are both nervous and emotional reactions at this point.

Once hired, the student/hospital relationship is phased out. The student may return for counseling or related services, but he must initiate the move. Follow-up studies show that after initial employment, students are fairly well able to change positions on their own.

CONCLUSIONS:

Failure of the educational system to produce adequately trained workers in the occupational fields contributes directly to low productivity and unemployment.

The opportunity for a N.W.C. student to participate in a successful occupational education program appears to depend to a large extent on:

What school system he/she lives in.
Class scheduling in the particular school system.
Home environment and parental influence.
Teacher-pupil relationship
Guidance counseling
Part time jobs, Travel and Other Extra Curricula Experiences

A detailed analysis of the Junior/Senior High School student's first career choice, when broken down by individual schools, indicated a wide variety of first choices in some schools (and towns) in contrast to a few stereotyped set of first choices in other schools. This would seem to indicate a different set of pressures, experiences or knowledge in operation with students of different schools or different towns.

All of the school systems surveyed indicated an awareness of the need for occupational education programs. However, the degree of participation and/or "reduction to practice" varies widely. The results of those schools that are actively pursuing the occupation oriented theme also ranges over a a considerable latitude, from an "unquestionable success" to a "not quite a failure". As reported previously, scheduling is a severe limitation. This becomes more acute when the student tries to participate in "split" programs which involve two or more school management systems, for example: academic classes in the "regular" high school or occupational courses in the "trade or vocational" school. Fragmentation into autonomous departments within a school system based on traditional or historical precedence appears in many cases, to work against the current premise: Effective occupational education is total education, not college preparation, not general education and not vocational training. Stated another way: There still exists in many secondary school systems in N.W.C., a demarcation between the college-bound student and the non-college bound. This priority placement of college preparation has served to place obstacles in the way of occupational training. These obstacles are evident in the following forms: traditional scheduling practices; emphasis on achievement in college preparatory subject; lack of cooperation and assistance between departments and school systems.

On the other hand, many educators in N.W.C. are displaying signs of cognizance of the foregoing shortcomings and remedial action is apparent in some of the school systems. The Work Study and Co-op programs, the increased recognition of the value of vocational training, the redirection of programs toward career preparation in several of the school systems lends credence to the conclusion that there is cause for hope